

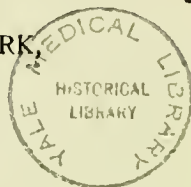
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TRANSACTIONS

OF THE

Connecticut
State Dental Association

AT ITS

Thirty-ninth Annual Convention

HELD AT

HARTFORD, CONN.

April 21 and 22, 1903.

PHILADELPHIA:

THE S. S. WHITE DENTAL MANUFACTURING CO.

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TRANSACTIONS

OF THE

Connecticut State Dental Association,

AT ITS

THIRTY-NINTH ANNUAL CONVENTION,

HELD AT

Hartford, Conn., April 21 and 22, 1903.

TUESDAY—Morning Session.

THE thirty-ninth annual convention of the Connecticut State Dental Association was called to order at 10 o'clock Tuesday morning, April 21, 1903, in Unity Hall, Hartford, Conn., with the president, Dr. Edward Eberle, Hartford, in the chair.

The first order of business was the reading of the minutes of the last meeting by Dr. Frederick Hindsley, secretary.

Dr. C. W. STRANG offered as a correction to the minutes the substitution of Dr. James McManus' name instead of that of Dr. Gaylord as read by the secretary, on the committee appointed to draft resolutions on the death of Dr. Charles C. Barker—the committee consisting of Dr. James McManus, Dr. Fones, and Dr. Strang, instead of Drs. Gaylord, Fones, and Strang, as the secretary had read.

On motion the report was accepted with the above correction.

The next order of business was the reading of the treasurer's report by Dr. E. B. Griffith, Bridgeport, as follows:

TREASURER'S REPORT.

BRIDGEPORT, CONN., April 20, 1903.

The treasurer of the Connecticut State Dental Association respectfully submits the following report:

RECEIPTS.

Balance brought over from last year.	\$433.97
Dr. G. O. McLean, Chairman Exhibit Committee	228.00
Dr. F. Hindsley, initiation fees and dues new members.....	115.00
Dr. G. O. McLean, Chairman Exhibit Committee	27.00
From members for dues.....	261.00
Interest to April 1, 1903.....	13.80

\$1,078.77

Disbursements as per vouchers.... 557.14

Balance on hand April 20, 1903. \$521.63

Respectfully submitted,

EDWARD B. GRIFFITH, *Treasurer.*

On motion the report was accepted as read.

The secretary then read the following applications for membership: Dr. Thomas A. Ralston, Southington; Dr. Geo. C. Eighme, Bridgeport; Dr. F. A. B. Forrest, New Britain; Dr. Guy B. Vroom, New Haven; Dr. Burton F. Bishop, New Haven; Dr. Edward J. Larkin, Waterbury; Dr. Geo. N. Bates,

New London; Dr. Michael K. Grady, New Haven; Dr. Chas. W. Roberts, Hartford.

On motion the above were voted for by the secretary with one ballot, all having been previously approved by the Board of Censors.

Dr. D. W. JOHNSTON, vice-president, having taken the chair, the president read his annual address, as follows:

PRESIDENT'S ADDRESS.

By EDWARD EBERLE, D.D.S., Hartford.

Mr. Chairman, fellow members of the Connecticut State Dental Association, ladies and gentlemen,—In extending to you a most cordial welcome to this, our thirty-ninth annual meeting, I exercise a privilege that affords me much pleasure.

You who for a time have put aside the burden of daily toil that you may be in attendance here during these sessions, I trust will not, when the hour of adjournment has passed, have any cause to regret that you have devoted two days to the interests and welfare of the association, and when you depart to resume your labors may it be with renewed energy and spirit, and with a sense of having fulfilled an obligation you owe alike to yourselves, your fellow members, and those whom you are called upon to serve.

May each of you gather here something that is likely to be of value or benefit to you, some method of treatment, use of an appliance, perchance merely an idea that may enable you to solve a perplexity, supply a deficiency, or a contribution of some kind that may tend to make life's labors more of a pleasure. How swiftly turns the wheel of time! The heat of summer, and the frosts and snows of another winter, accompanied

by the vicissitudes of life, have again passed into history. These dawning years of the new century bespeak a wonderful augury for the future, though it would seem that with billion-dollar combinations, wireless telegraphy, and like achievements, the utopian age had arrived. But no!—the world, and science with it, moves on with such gigantic strides that the most fertile imagination falls far short of the possibilities of the years to come. In the onward march the science of dentistry is no laggard. The extension of the college course to four terms, the increased and growing membership in our societies, the introduction of a corps of dental surgeons in the army, and, along the lines of research, Professor Kirk's microscopical analysis of the saliva as an index to disease, and the work of Williams, Miller, and Black are but examples, and demonstrate that we are not in a state of lethargy.

Less than a decade ago a meeting of over three or four hundred dentists was worthy of considerable note. The fifteenth anniversary of the Odontographic Society of Chicago, attended by over two thousand, and the manufacturers' exhibit held last March in Philadelphia, where five thousand passed through the

turnstiles, have caused little more than a ripple on the surface of the rapidly moving panorama of to-day.

The meeting of the International Dental Federation and International Commission of Education in Stockholm last August was attended by men of eminence from the foremost countries of the world. On that occasion Connecticut was represented by our honored Dr. Strang. An all-important subject considered by the Commission at that time was the preliminary education required of the dental student, and the period and arrangement of the curriculum, which consideration by that body was in reality a basal step toward the accomplishment of the very-much-discussed and greatly-to-be-desired unification of dental laws.

It is gratifying to note that the fraudulent diploma mills of Illinois are being gradually but successfully suppressed, and that the regular American graduate will once more receive just recognition in the German empire as well as in other foreign countries.

At the present time there is scarcely a country of importance, or a state or territory, whose statute-books do not contain a law requiring from all who have chosen to enter the profession of dentistry substantial proof as to ability and proper qualifications to practice. Here in our own state, the Dental Commissioners have endeavored to place Connecticut on a high standard, and their efforts are in a large measure successful.

I would impress upon your minds the advantages and pleasures to be derived from membership in the National and Northeastern associations, and urge upon all who have not yet become members a careful consideration of the importance and value of a close relationship to these societies.

Thirty-nine years ago the fifteenth of next September an invitation, signed by James McManus and Leroy D. Pelton as a committee, was sent to every dentist in this state to meet and assist in organizing a state dental society. The following is an extract from that invitation: "That *esprit de corps* which is the soul of a professional body has forever had a hard struggle to exist (if it existed at all) among the dentists of Connecticut." What a contrast when compared with the condition of growth, harmony, and prosperity pervading our association to-day!—an example of the development of good works in the land of steady habits, slow but sure.

As individuals, has our advancement been commensurate with our experience? How often do we profit by our failures? Measured by the standard of progress our daily life is but a series of successes and failures in proportion to the skill we possess in a greater or lesser degree, sound business judgment, and a clear conscience.

The restoration of the incisal angle with an open-face gold crown may seem to be a success in so far as the crown is concerned, but such practice savors strongly of an easy method of obtaining the fee, and therefore cannot be seriously claimed to be a success. It has been said that the alluring crown and bridge has proved to be the best graft, using the word of to-day, that the profession has ever witnessed—though it cannot be denied that the advent of crown work opened a new era, since which comparatively few teeth need be consigned to the forceps.

Porcelain for inlays has many supporters and is gaining ground. Although with the present methods of procedure a sharp discrimination in its use

is essential on the part of an operator not thoroughly skilled in the ceramic art to insure permanence, still the beautiful results attained by Jenkins, Head, Capon, and others are a tempting incentive to many practitioners to venture.

I would suggest for your consideration, not necessarily to be acted upon at this time, but as food for reflection, that some means be devised, in one way or another, toward teaching the children in our public schools the importance of oral hygiene and the proper care of the dental organs.

Furthermore, the establishment of a free dental dispensary, under the auspices of our association, or of local dental societies—which I believe to be one of the probabilities of the near future—would be a commendable project and a most beneficent work of charity.

I avail myself of this occasion to invite your attention to the fact that a large amount of work on the part of several of your executive officers is necessary to conduct our sessions as they are being held to-day. Some of our active workers have proposed that as a means of partially relieving the secretary and the executive committee of their arduous labors and duties, a committee be added, to be styled and known as the "Program Committee," which shall be charged

with the preparation of the annual list of papers and clinics. The proposition seems to be a good one, and I am heartily in sympathy with the idea as one worthy of favorable consideration.

Several years' experience as your secretary and a practical knowledge of the duties incumbent upon him who fills that position, prompt me to suggest to you the advisability and propriety of the payment of a suitable compensation to the secretary and also to the treasurer, and that such compensation be provided for, either by an amendment of our by-laws or by resolution from year to year.

In conclusion, I desire to express my appreciation of the assistance I have received from many in the discharge of my duties as your presiding officer during the past year. I trust the work and deliberations of this convention may be productive of good and satisfactory results, and pledge my hearty co-operation in all that you may undertake to do for the best interests of our association.

Let us strive for ideals founded upon honesty of purpose, and ever keeping those ideals before us meet duty unfalteringly, to the end that the sunset of our earthly existence may be radiant with recollections of a life well spent and with a hope of reward that is in the life to come.

On motion the address was referred to a committee of three to be appointed by the chair to report on the president's address later in the session.

Dr. Johnston appointed Drs. Strang, Metcalf, and James McManus as members of that committee.

Dr. STRANG. Before the reading of

any papers, I would like to make report for the committee to draft resolutions on the death of Dr. Barker. This committee was appointed last year, but so late in the session that we did not have time to make a report during the last session. Dr. Strang then read the following resolutions:

Died November 30, 1901, Dr. CHARLES COFFIN BARKER, aged sixty-three years.

WHEREAS, It has pleased an all-wise Heavenly Father to remove from the sphere of his activities to the "mysterious beyond" our friend and fellow-worker, Dr. Charles C. Barker, we desire to give expression to our sense of the loss our profession has sustained in the taking from our ranks one who for many years labored, ever ready to maintain its dignity and honor; therefore be it

Resolved, That in his death this association loses one of its valued and trusted counselors, a faithful and efficient worker. The dental profession loses a member who by his high character and skill, and his dignified

and courteous bearing, commanded the admiration and respect of all his associates.

(Signed)

CLINTON W. STRANG,
JAMES McMANUS,
CIVILIAN FONES,
Committee.

On motion it was decided that the resolutions be spread upon the records and a copy sent to the family of Dr. Barker.

The society then listened to a paper from R. A. McDONNELL, M.D., New Haven, Conn., as follows:

SKIN DISEASES OF INTEREST TO DENTISTS.

By R. A. McDONNELL, M.D., New Haven.

THROUGH the courtesy of the New Haven Dental Club, the writer was invited last winter to read a paper on the above subject, which elicited a very interesting discussion. One gentleman, who had practiced dentistry for upwards of forty years, stated that never in that time had he known of a single case of contagion occurring in a dentist's office. Another gentleman, evidently assuming that my paper was an ill-natured attack upon dentists in general, called attention to some of the unsanitary practices of physicians, and challenged the writer to defend them. But it is with an entirely different purpose that attention is called to the possibility of various contagious diseases of the skin being contracted or conveyed in dentists' offices.

In the first place, a number of dentists have consulted the writer on account of contagious diseases of the skin. In the second place, a number of laymen, who attributed their contagious skin diseases to visits to the dentist, have also consulted him.

These facts being allowed, it is not only possible, but actually true—and, furthermore, probably of not infrequent occurrence—that the close personal relations of dentist and patient may result

in danger to one or the other, unless certain precautions are taken against it.

To cite an illustrious case, when Oliver Wendell Holmes announced that physicians were undoubtedly the unwitting cause of puerperal fever in their patients, when they attended, at the same time, cases of erysipelas and obstetrics, doctors were loath to believe that this could be true, but it is now a universally accepted fact; and so it may be that dentists who, until recently, have practiced their profession in happy ignorance of danger, may upon reflection recall instances where they may possibly have been at fault.

With improvements in our knowledge of the bacteriological causes of disease, it is plain that the infectious germs found about the face in certain skin diseases may readily attach themselves to the hands, clothing or instruments of the dentist, and thus either produce disease in him, or through his medium be transferred to subsequent patients. I refer to such diseases as syphilis, impetigo contagiosa, trichophytosis, scabies, pediculosis, and alopecia.

In the practice of the writer there have been several instances of extra-genital syphilis readily traceable to wounds in-

flicted by dentists' instruments. A chancre of the gum, a chancre inside of the cheek, and a chancre of the angle of the lips have come under the observation of the writer, and, in his opinion, were certainly due to the above cause. On the other hand, three dentists, one very recently, have presented themselves for treatment for syphilis, acquired professionally.

It is not a rare occurrence for, physicians to become infected with this disease while treating their patients, and *a priori* it would seem that dentists were more exposed to this possibility than physicians, for long after all contagious lesions of the skin have disappeared there persist in the mouth mucous patches of the greatest virulence, and with the astounding prevalence of syphilis, especially in large cities, it is unquestionable that most dentists are called upon not infrequently to treat this class of patients.

There are four contagious conditions produced in the mouth by syphilis, and these I will briefly describe.

The first, and least common, is the chancre. It may occur anywhere, upon the tonsils or lips most frequently. This takes the form of an open sore, secreting a moderate amount of a thin pus, and is accompanied by massive swelling of the glands adjacent, the submaxillary, parotid, and post-cervical. Usually with this there is a moderate pharyngitis, and in the course of a month or two the characteristic rash appears upon the skin.

The second and by far the most frequent contagious condition is the mucous patch, an opalescent, superficial erosion of the mucous membrane of any part of the mouth. This may be present at almost any stage of the disease, and is a source of the very greatest danger. It

gives rise to a scant serous discharge which is highly contagious. It is usually oval in outline, but may be irregular, and varies in size from that of a pinhead to a patch large enough to cover the whole of the inside of the cheek. Its favorite locations are the tonsils and their pillars, the under surface of the tongue, and the inside of the cheeks where they rub against rough teeth.

The third form of contagious syphilis in the mouth is the ulcerating gumma, which is usually found in the tongue. It presents a rather deep ulcer, which secretes a moderately contagious pus.

The fourth, and a very rare form is the leucopathia of the tongue which presents broad, white, sharply outlined patches, which secrete but little. It is to the mucous patch that more cases of innocent syphilis are attributable than to any other form of the disease, and it is to these that I particularly desire to call attention.

Mercury given in larger doses than are well borne first affects the gums about the teeth, causing inflammation and the secretion of an infectious saliva. When the disease has been recognized, the dentist owes it to himself to be very careful of his hands, and to subsequent patients to thoroughly sterilize his instruments; for it seems to me unjustifiable to decline to treat a patient merely because he is in a contagious condition, since care will obviate all danger. Cuts and abrasions of the hands should be protected by collodion, or thin rubber gloves should be worn. All instruments used, whether in syphilitic mouths or in those of apparently healthy persons, should receive absolutely the same treatment.

It is perfectly disgusting to anyone to think of using another's toothpick or brush, even though it has been rinsed

and wiped. No dental instrument should be used on a second person until it has been scrubbed with soap and water and sterilized.

Many objections to the sterilization of instruments by boiling were brought out in the discussion on the previous paper. It has been said that the temper of the steel was injured, that the nickel soon gave out, and the instruments quickly rusted. But, in spite of these objections, I am still convinced that boiling is the best method at your disposal. Formaldehyde sterilizers are, I understand, very expensive. Immersion in solutions strong enough to destroy germs will also injure instruments. Small copper sterilizers for boiling can be procured at very moderate expense, and are absolutely to be relied upon. If the nickel of instruments gives out, let them be re-nickeled. The mental impression produced upon the patient who sees the instruments about to be used upon him removed from boiling water is in itself, aside from other considerations, worth the trouble.

The next disease in frequency is impetigo contagiosa, a common affection of the skin. A barber in New Haven was recently sued by a lawyer who alleged that he contracted this disease in the barber shop, but it might be acquired just as easily in a dentist's chair, since it is through the media of hands and towels that it is usually conveyed. It is characterized by the formation, usually upon the exposed portions of the body, of one or more little blisters, whose contents, within a few hours, become turbid and pustular. The vesicle rapidly increases in size, until it is possibly as large as a little finger nail, and then, having a very thin roof, it breaks and its contents escape. The secretion soon

dries upon the surface in the form of a yellow crust, which is perfectly superficial and looks as though it were stuck on. Oftentimes there is a faint red areola round the vesicle or crust. The spot usually tingles or itches slightly, and presents a very unsightly appearance. Every one of these lesions is a possible focus of infection, for if the patient touches such a spot with his finger, and then rubs himself elsewhere, he usually spreads it. The course of the disease is indefinite, successive crops of blisters continuing to appear until stopped by thorough measures. The disease is due to the staphylococcus aureus, or common pus germ, and is a highly contagious affection. I have treated dentists for this disease, and consider that it may be spread as readily by them as by barbers, who usually get the credit for it. This is not the real "barber's itch," but is often mistaken for it. Veritable epidemics of it have occurred in New Haven three times within my knowledge, and one is just dying out.

Aside from the dentist's hands, the cloth which is tucked into the neck of a patient who may have the disease slightly, and then used upon some subsequent patient before being sterilized by washing, is the common medium of contagion.

The next disease to be considered is trichophytosis, ringworm, or genuine barber's itch. This when once thoroughly started is one of the most obstinate diseases of the skin, taking many months of painful and radical treatment to stamp it out.

The beginning lesions are as a rule easily recognized, from the fact that they generally take on a ring form, beginning with a small scaly patch, which progresses around the border and clears up

in the center. Sometimes, in delicate skins, the border is marked by a circle of minute water-blisters, instead of scales: but the liquid contents of these soon escape, and scales are left. There are seven diseases of the skin which take on this circular arrangement, but only one which is contagious affects the face, neck, or hands, and that is ringworm.

After the disease has existed for some weeks the ring shape of the lesions is not so noticeable, for the border of the circles becomes broken in places, and separate scaly patches, without any regular arrangement, may be left. In men, if the disease occurs in the bearded region, the appearance is altogether different. The vegetable parasite which is the cause of the eruption invades all epithelial structures, therefore it penetrates to the bottom of the hair follicles, and is even found in the hair itself.

When it gets into the hair follicles, it usually produces suppuration, so that the face is lumpy, and many hairs may be seen protruding from pustules. In this stage the disease will hang on indefinitely, finally, if unchecked, invading the whole bearded region and producing a boggy suppuration which is most disfiguring. This disease, like *impetigo contagiosa*, may easily be spread by the hands, towels, or coatsleeves of the dentist.

Scabies, or the itch, is commonly supposed to be a plebeian disease, but it has found its way into the most aristocratic circles. It is characterized by the formation of pustules which do not itch much during the day, but which claim a vast deal of attention when their owner gets warm and snug in bed. They are found most abundantly where the skin is thin, as between the fingers, on the wrist and upon the neck. The patient is usually

quite industrious with his nails, and scratches the pustules into excoriations. Beneath the nails of such people the *acarus* finds a safe transport to fresh fields. Shaking hands with a victim, or resting the wrist against his neck may be a means of contracting the disease.

Pediculosis, or lice, may also occur in the most cleanly of people, for these bugs are no respecters of persons. I have treated some of the most cleanly people in New Haven for an eczema of the scalp which had lasted for years, caused by nothing in the world but lice. They infest the part of the scalp where the hair is most thick, the occipital region, and this is the part that occupies your head-rests. They cause a redness, scaling, crusting and oftentimes a serous oozing of the occipital region, with enlarged glands in the back of the neck. Many a case of so-called *scrofula* is nothing but pediculosis. Nits, or eggs, are often found attached to the hair, looking like little flakes of dust, but firmly attached to the shaft of the hair.

While speaking of heads, I must not fail to mention the fact that dandruff, the most common cause of baldness, is contagious. There is no doubt whatever that the use of common brushes and combs, resting the head against seats in cars, or upon the head-rests of barbers' or dentists' chairs, are practices which spread baldness. Therefore the head-rests should come in for a thorough cleansing with soap and water, and a sponging with an antiseptic solution, not infrequently.

From the foregoing remarks it may be seen that the most frequent carriers of contagion in dentists' offices are—(1) instruments, (2) towels, (3) hands, (4) coatsleeves, (5) head-rests, (6) brushes and combs.

Something might now with profit be said about the dentist's hands. I have no doubt that every man present washes his hands after treating each patient. Such frequent washing, unless the greatest care is used in selecting a pure soap, will almost inevitably result in roughness of the skin, especially in winter, and in many cases, in actual eczema. I had great trouble myself from this source until I have finally hit upon a soap which I can thoroughly recommend. It is called Quinorcin soap, and is said to contain quinin and resorcin, making it

antiseptic. At any rate it is very cleansing and unirritating.

There are a number of other contagious diseases of the skin which, were we simply looking for "padding" for this paper, might be properly treated here; but my object is not to worry you with a long discourse, but rather to point out what seem to me obvious and actual dangers. I must apologize for having repeated many of the things said in the paper before alluded to, and must express my grateful appreciation of your courtesy in inviting me to meet you.

DISCUSSION.

E. R. LAMPSON, M.D., Hartford. By way of apology I will say that Dr. C. C. Beach of Hartford was to have discussed this paper, but since he was not able to be here I was asked only a few minutes ago to open it in his place. I think this is a topic that is not as thoroughly appreciated by dentists as it should be and not so much so as it is going to be in the future. The essayist referred to Dr. Oliver Wendell Holmes bringing before the medical profession—in 1853, I think it was—the fact that puerperal fever was an infectious disease. Dr. Holmes was not the first one to advance this idea. Nearly fifty years before that a surgeon in England tried to persuade the medical profession that puerperal fever was contagious, and a few years after Holmes a German investigator tried also to persuade the profession that this was an infectious disease. Only during the last twenty years has it been acknowledged as such. It has taken the medical pro-

fession years to appreciate this fact and to acknowledge it. The dental profession may have been somewhat backward in the aseptic treatment of their instruments, but they are coming to it now, and I do not think it will take them as long to recognize the importance of this as it did the medical profession the danger of transmitting puerperal fever.

Dr. McDonnell mentioned several instances where dentists had acquired syphilis from their patients. A short time ago I was much annoyed to find that one of my patients who had syphilis was being shaved in the same barber-shop in which I was shaved. I had my own brush, comb, mug, and shaving brush; the only thing I did not have was a razor. On going into the shop recently I found that this gentleman was being shaved by the same barber that usually shaved me. I immediately bought me a razor.

It is impossible to tell what class of

patients are going to have these diseases. Unfortunately syphilis is acquired innocently in a great many cases. Your very best patients, women as well as men, may come with a mucous patch in their mouth which you may consider a cold sore, and unwittingly may convey this dread disease to some other patient.

Dr. McDonnell said he did not attempt to mention all the diseases which may be of interest to the dentist. There are others which are often confounded with certain stages of syphilis, such as epithelioma of the tongue, the gums, or of the tonsils. These are often confounded with the chancre of the primary stage, and tuberculosis of these regions is often confounded with the tertiary stage of syphilis, both of which occur in the mouth.

I saw a short time ago a patient who had been to one of the best surgeons in Hartford. She had been operated on several times. She gave absolutely no history of syphilis. She had an ulcer in the mastoid region which involved the ear. He finally told her that he could do nothing for her unless he cut the ear off. She came under my care and I put her on potassium iodid and mercury and she is now well. Thus it will be seen that it is not an easy thing to detect these lesions of syphilis. Of course syphilis is the most dreaded of all diseases, and I think the instruments used by men who extract teeth, as well as those in filling, are often responsible for these conditions. Very frequently in extraction, where there is an alveolar abscess, if the instruments are not made thoroughly aseptic, the next person may be infected. Of course there are lots of cases that escape infection under these circumstances, but that is because the blood supply is so great in this region. The object of asep-

sis is to prevent the one case in a hundred that may be infected.

There is one very common disease of the mouth that the doctor did not mention that is very easily transmitted, and that is thrush. Of course this occurs most frequently in children, but is very easily transmitted from one patient to another by the use of septic instruments. Fortunately it is very easily cured.

Occasionally you may have in your office a patient with diphtheria, and this disease may be easily conveyed to other patients. In the first place the germ of diphtheria is present in some normal throats, and for some unknown reason it may set up no infection at all, but conveyed to some other person may set up infection which will perhaps prove serious. I think that it is remarkable that diseases are so infrequently conveyed through dental instruments, and I must say that there are instruments used by other professions that are as liable to convey infection as the dentists' instruments, namely, those of the nose and throat specialists. A great many of these are not so careful with their instruments as they should be, which I think is frequently the cause of infection.

I am of the opinion that asepsis is a great element in the success of many of our young practitioners who are thoroughly boiling all instruments before using them in the mouth. It is a subject which you may say is not changing, it *has* changed, and it is to the personal advantage of each dentist, each specialist, and every surgeon, to be as careful as he possibly can with his instruments.

Dr. E. S. ROSENBLUTH, Bridgeport. The paper by Dr. McDonnell is very timely. A paper on antiseptic dentistry is always timely. There is nothing that

demands more care than our efforts to protect patients from infection while under our care. We have a great variety of germicides, and water which can be boiled. Instruments mechanically cleansed and boiled for fifteen minutes in a mild solution of sodium carbonate to protect them from rust are safe to use. An effective steam sterilizer may be constructed at small cost, by fitting a perforated tray and cover to an oblong agate iron dish. Mouth-mirrors and stones are best sterilized in a glass receptacle by the use of sodium dioxid to which a small quantity of water is added and allowed to stand for several minutes. For excavators, burs, clamps, and other small instruments a saturated solution of lye with a few drops of 40 per cent. formaldehyd in a glass vessel will be found convenient, allowing the instruments to remain for fifteen or twenty minutes. Clean napery, it seems unnecessary to say, is essential to the practice of dentistry. Nothing is more conducive to the building and retaining a practice than a plentiful supply of clean towels and napkins, which should be fresh from the cabinet for each patient. There should be no tumbler on the fountain spittoon, but tumblers at hand so that a clean one may be used for each individual.

Dr. A. J. FLANAGAN, Springfield, Mass. This is a very old question. I myself have heard it discussed for the past fifteen years, and we see to-day many moral degenerates who do not take any precautions to prevent infection of their patients. We had last night a very able address by a clergyman on ethics. Perhaps ninety-five per cent. of all professions think of ethics as the relation of one practitioner to another. There are ethics that are higher and more essential, and that is your relation to your

patient. Now, it is probably safe to say that in general practice not more than three cases in a hundred that come under our supervision are liable to cause infection; but is it safe to take chances with the ninety-seven cases? It is absolutely necessary that we should treat all cases alike. I think Dr. McDonnell has a good deal of courage to come before such an assembly as this and talk on this subject. He spoke of the question of a coat the operator wears giving infection. Let us go back to the days when it was an unusual thing for a dental operator to wear a coat that was washable. I am sure that you can find a good many offices at the present time where the operator does not discard a coat until it is worn out. Now, suppose when you were sick and carried to a hospital, the attendants were to come in with soiled or half-worn-out coats? If you go to a hospital you will find that they are not taking the ninety-seven chances, for they get down to the fundamental principles of asepsis in each case.

If a man is a moral degenerate in the sense that he does not understand his relation to his patients, he will continue to be the same thing. There is a moral something that has to be educated into the man before he will take these precautions. Let us put ourselves in our patients' places.

Dr. A. C. FONES, Bridgeport, Conn. I do not know that I can add anything to the subject. I would say, however, that those who are in the habit of boiling their instruments perhaps do not appreciate the length of time it takes to cleanse and sterilize them. It has been shown by tests that nothing under seven minutes of boiling is safe. I do not think we should use napkins in the mouth, send them to the laundry, and

use them again. Cloths used in the mouth should be discarded.

The old saying that "Where ignorance is bliss 'tis folly to be wise" has passed away to a great extent, to my mind. We can no longer be blissfully ignorant of the dangers of infection. When we go to our meals at public places, hotels, etc., we cannot but think that the coffee cup has never been sterilized from the day it was baked. The forks and spoons have been in the mouths of hundreds of people, passed through some warm water, and possibly wiped off with a dirty towel. We cannot afford, however, to worry ourselves over these conditions, for life would become unbearable; but when it comes to our offices, where we know the dangers and where we can prevent these risks, it becomes our duty to take every precaution.

No man can progress in dentistry today unless he is clean. He must be clean with his instruments, with his work, and with himself. If he fails in this particular he will settle in a rut, with but little chance of advancement. The time has come when every ethical man, as Dr. Flanagan says, has to be educated up to the necessity of these things. After he once realizes the importance of his relations and obligations to his patients he will not be negligent in a single case.

Dr. JAMES McMANUS, Hartford. As a Hartford man and a member of the society I do not want to lose this opportunity of thanking Dr. McDonnell as a brother practitioner of New Haven for coming here and reading so interesting a paper this morning. One gentleman has suggested that the medical profession has been very slow to realize the importance of this question. I think as a profession they have done a great work in this line of sterilization, and in teach-

ing others the importance of it. We have all seen in the past bad results from carelessness, and we will in the future. We have not been so particular as we should have been. Certainly we have it in our power to do a great deal of harm, and we should take all the precautions we can to have everything just as clean as possible.

Dr. McDonnell has presented the subject to us as dentists in a very clear way, and I think he has done a great deal of good. As a profession we have not had these matters brought to our attention as we have since his paper was read some time ago, and I feel very grateful to him for coming here and reading the paper.

Dr. C. FONES, Bridgeport. It has been a great many years since I first knew of bacteria, but at that time little or nothing was known of their action upon the teeth. For many years I have been in the habit of cleaning my instruments by passing them through the alcohol flame, and I believe it is an effective method of sterilizing them. As the instrument first passes through the flame a little moisture will appear, but after the second or third pass the moisture disappears and the steel is dry and clean. This practice I have kept up until the present day, and I have never known of a case of infection in my own practice. It is difficult for any organism to withstand the flame, even for a second, and I believe instruments treated in this manner are sterile.

The subject of the paper is, I consider, an excellent one to bring before the society—one on which we cannot hear too much; but the dentists present are not the ones who need these instructions the most, as I am satisfied that the larger percentage of our members practice these methods. The class of men

who should hear this paper are those outside of our society, those for whom we have to legislate. I know of a case of infection in my own city now. It was not caused by a member of this society; it came from a different class of dentists. The papers should take this matter up and let the public understand the dangers of unclean instruments.

I think that we who preach antisepsis are sometimes apt to go to extremes. I remember at one time, when this subject was being discussed, a gentleman advocated putting a steam boiler in every laboratory so we could have live steam at our chairs for cleaning our instruments. Of course that would sterilize them effectually, but such a position is an extreme one to take.

Now, Dr. Flanagan says that the coat should be changed more often. Why not change chair, carpets, and furniture of the office every day? If I wear a fresh coat to-day, and still believe it to be clean to-morrow I will wear it and feel pretty sure of not infecting my patients. I think we may go to extremes in this matter.

Dr. FLANAGAN, Springfield, Mass. I cannot agree with Dr. Fones with regard to his ideas of practicing antisepsis. Dr. Fones says he wants to be antiseptically clean, but he wants the privilege of deciding for himself what is clean. Is that not "extreme"? He candidly admitted that he wanted to decide the question himself. Dr. Fones claims that when he puts on a coat and is satisfied it is clean he feels no fear of infecting patients. I claim that he does not know whether a coat is clean or not after wearing it once. We have specialists in the line of bacteriology who set a standard for us to go by, and it is safe to live up to it. The bacteriologists say that we must do

certain things to protect our patients. I agree with Dr. Fones that they are extremists, but they are specialists who are doing their life-work in this line, and why should we not acquiesce with them and try to live up to the standard they set? It is foolish to say that we know better than they when things are aseptic. If I wanted a sermon preached I would not go to a barber, but to the clergyman whose specialty it was, and would rather take his opinion than the barber's, and I am positive that if Dr. Fones wanted a tooth extracted he would not go to a blacksmith. You may say they are extremists, but every specialist is an extremist.

I claim that there is no better way for a man to educate the public than to sterilize his instruments. Now, if the bacteriologist says the steam sterilizer is the thing to sterilize with, I say, Put it in. If they say boiling, let us boil. It is not safe for us to take chances. A great many of the instruments we use are not safe except when boiled, or sterilized in a steam sterilizer. The manufacturers can be taught to make the vast majority of instruments of such a form that a steam sterilizer can do them no harm.

This question is as broad as it is long, and I must say that if we are to be scientific men we must educate the public from a scientific point of view.

Dr. C. FONES. I do not see that there is such a great difference in regard to our opinions of sterilization. I would like to ask Dr. Flanagan if he changes his coat every day.

Dr. FLANAGAN. I will answer by saying that I do not always change coats every day. The coat question is only a very minor point in asepsis. What I claim is that we must get to the funda-

mental principles of this question and be guided by what the bacteriologist says regarding sterilization of instruments, etc. There is certainly a greater percentage of safety in a coat that has been washed than one that has not. My argument on the coat question had direct reference to practitioners wearing the so-called house coats or smoking jackets to operate in day after day, until they are so "greasy" that they are discarded for a new one. My plea is for the use of educated sense—even in the use of operating coats.

Dr. C. FOXES. I do not talk against sterilizing instruments. What I am getting at is the extremes to which we go in advising sterilization. I say if we are to go to the extreme, as Dr. Flanagan indicates with reference to the coat, the only way to be sure would be to change our chair, carpets, etc., every day. That is what one must do to be absolutely sure.

Dr. FLANAGAN. I do not doubt that it would be best for us to operate in a sterilizer, but that being impractical I say it is our duty to take every precaution we can to protect our patients from infection by using every means science has decided to be effectual.

Dr. C. W. STRANG, Bridgeport, Conn. I want to say that a very favorable and valuable impression was made on my mind when I was only fifteen years of age. I went into a dentist's office to have some work done, and I remember the gentleman very distinctly to this day. He was a man who had graduated from the Baltimore Dental College. The gentleman I refer to was the late Dr. G. W. Perry of Yonkers. Dr. Perry I thought was the cleanest man I had ever looked upon. He had on a clean white coat, and everything about him was clean. At that time I had no idea of following the

profession of dentistry, but it made an impression on my mind that has always remained with me. I studied dentistry, and began to practice, and I said, "I will get a supply of white coats and I will try to wear clean ones while operating." That impression made upon my mind has ever been with me. As soon as one coat is soiled it is discarded and a clean one substituted, and I think that thing had a great deal to do with my being able to establish myself in dentistry. It makes a good impression upon the patients who visit you.

I believe in being as thoroughly aseptic as we can, but in the matter of napkins, spoken of by some of the gentlemen, I am not quite ready or willing to give up the doilies that I have used all my life. I believe if doilies are laundered properly they will come back to us in a condition safe to use. I do not doubt that the new aseptic napkins may be safer to use, but I am inclined to think that the impression made upon the patient is not the same as when they can see in your office a drawer full of clean white linen, properly laundered.

After forty years of practice I can stand here to-day and say that I never saw a case of infection where I believed it was contracted from unclean instruments. When I have operated upon a case where I think there is a liability of spreading infection I always boil my instruments thoroughly before using again. I always wash my instruments off in electrozone and I feel reasonably safe in using them after this treatment. I would do unto others as I would have them do unto me. I would put myself in my patients' place, and not subject them to risks that I would not like to assume myself. I would not want anybody to use instruments in my mouth

that had not been cleaned after using them in another mouth.

Dr. O. T. RULE, Meriden, Conn. Perfect antiseptis in dentistry is an impossibility, and although Dr. Flanagan objects to Dr. Fones' setting up a standard of safety in reference to it, yet by not changing his coat after each patient he acknowledges that he decides for himself, and, gentlemen, we must all decide for ourselves as to just how far we will observe antiseptic precautions.

In the discussion of this subject there is one fact we must not overlook; the fact that we all have a vital resistance to every enemy of our system. In view of the fact that bacteria of many kinds are ever around and within us, the only explanation of our living now is that our vital resistance has at all times been able to destroy these bacteria, or to have at least kept them in abeyance.

In the human system we find a difference in degree of susceptibility to infection *i.e.* the nails are immune, the skin is susceptible, mucous membranes are very susceptible, etc. Although our field of operation is entirely inclosed by a mucous membrane, I consider it unnecessary for us to observe antiseptic procedure to the same extent as is done in hospitals, for there is this difference between them and us: in the hospitals the surgeons expose to the atmosphere and its bacteria large mucous surfaces of the viscera which are normally unexposed, also the circulatory systems are tapped, etc. Our field of operation, although on or near the mucous surface, is one that is always exposed to bacteria and is immune from the usual horde because of its vital resistance. Therefore, I conclude that if we cleanse our hands and have our instruments perfectly sterile, so that we shall not carry any micro-organisms into

the mouth by *them*, we have done all that is necessary for the protection of our patients, and have observed the golden rule of which Dr. Strang spoke. I say that the washable office coat is not necessary for this reason. The ordinary brushing of our clothes makes us safe from being sources of infection. We do not demand that the persons with whom we converse on the street should have passed an examination as to whether or not they are disinfected, and our relation to our patients so far as dress is concerned is exactly similar.

While I say that the office coat is not a question of vital importance viewed from the standpoint of asepsis, yet I say that from an esthetic standpoint it seems a good plan to adopt it, if for no other reason than that our patients will be pleased to note this careful attention to dress, and will assume that it implies like care to all other parts of our work.

Dr. A. H. SPICER, Westerly, R. I. It seems to me that one of the greatest sources of infection, and one that we are apt to overlook, is the hand, and especially under the edges of the finger-nails. We may boil coats, napkins, and instruments, but we cannot boil our hands. They are always with us and we cannot overestimate the necessity of absolute cleanliness in regard to them.

Dr. C. B. ADAMS, Bridgeport. I think the last gentleman's remarks are very good indeed. There has been some accusation about our being extremists. Now, I would suggest with regard to sterilizing small instruments that we go to extremes. I do not think it sufficient for us to dip an excavator in alcohol for an inch and a half and call it sterilized. Handling the instruments may be a source of infection. As the last gentleman said, the hands are always with us,

and are liable to carry infection. Even shaking hands is liable to carry infection from one to another. The idea of dipping the instruments into a disinfectant is not sufficient. In operating we all know that frequently the saliva will run down the handle of the instrument and get on your hands, and this will be carried to other instruments in handling, and for that reason I think the handles ought to be sterilized as well as the points, and yet you find it comparatively rare that a man sterilizes the long handles of his instruments. They cannot be boiled without ruining their looks, yet it is just as important that some steps be taken to sterilize them as any other portion of the instrument. This saliva,

etc., will dry on the handles, and the next time they are used the hands will probably moisten them, and this is liable to infect your patient. It is not in cutting enamel and dentin that we are liable to infect the patient, but there is more liability of infecting the patient's face from the handles of your instruments; and so I say, gentlemen, it is best for us and for our patients that we go to the extreme in this matter of protection to our patients, by the thorough sterilization of our hands, instruments, etc.

The subject was passed, as Dr. McDonnell was not present to close the discussion, having been called away.

On motion the meeting adjourned until 2 o'clock P.M.

TUESDAY—Afternoon Session.

The meeting was called to order at 2 o'clock by the president.

Dr. WILLIAM CRENSHAW of Atlanta, Ga., presented on a chart the matrix devices devised by him, including the molar and bicuspid which he described in the *Dental Cosmos* in its issue for July 1902, page 681, and the anterior tooth-device recently completed. His explanations and demonstrations sought to go over the use of the devices in practical work.

Dr. Crenshaw showed how the molar and bicuspid device may be adjusted by letting out and taking up to fit both large and small teeth, and how it may be used to secure the contour and contact of the

teeth and the preservation of the interproximal space. He also explained how the matrix may be used to build the cervico-approximal wall of molars and bicuspids with soft gold or with tin, from a depth so far beneath the gum that the dam cannot be employed until after this wall is built practically to the occlusal surface of the teeth. The explanation embraced the working of amalgams and other plastics, and how to do this without marring the contour in removing the matrix.

The new front-tooth device which was shown for the first time is that described by Dr. Crenshaw at page 623 of the issue of the *Dental Cosmos* for August 1903.

DISCUSSION.

Dr. E. S. GAYLORD, New Haven. I would like to ask Professor Crenshaw's definition of what he chooses to call soft or non-cohesive gold?

Dr. CRENSHAW. That question is constantly coming up in the teaching of dentistry and we are making definitions of non-cohesive or soft gold and cohesive gold. I am not sure that I understand what differentiates soft or non-cohesive and cohesive gold. If you should ask me to name a strictly non-cohesive gold I should say Abbey's. That is strictly non-cohesive and cannot be annealed and rendered cohesive. It is ruined for the purposes of the dentist by applying heat to it. I do not know whether Abbey's soft gold has copper in it or not, or whether it has something on its surface that keeps it from cohering. I have not had occasion to use many of the different preparations of gold, and my methods have been rather simple. I began to use foils thirty-three years ago and have never departed from the practice. I believe there is something gained in the dentist taking up one preparation and sticking to it, because he learns to manipulate that well, and I think he loses time and skill in changing from one to another. If you ask me what foil I am using I would say The S. S. White Co.'s No. 4 soft foil, and I will say that my fillings are in the main made of cushions, and these in turn of soft gold. The soft foil made into cushions is crumpled between the fingers and then straightened out, leaving the sheet, although straightened out, wrinkled. It is then folded two or three times and rolled into a rope and cut into three or four pieces. when you have in this rope

what would be equivalent to a size 1 cylinder. This rope doubled upon itself gives a cushion the equivalent of a size 2 cylinder, and again doubled gives a cushion the equivalent of a size 4, and so on. You will find that the cushions of proper size can be condensed readily into the corners and angles of the cavity. This can be done in the mouth easier than out of it.

With regard to the difference, therefore, between soft and cohesive gold, I can give you no better definition than I have already hinted at. The makers tell me that non-cohesive gold is pure gold treated so as to make it non-cohesive. They do not tell all their processes of manufacture, and I do not think it is necessary for us to know them to be able to handle the material.

Dr. JOHN I. HART, New York. I think some form of matrix extremely advantageous in the character of cavities indicated by your essayist. I know of none better than the ones devised by Dr. Crenshaw. I think, however, that his fillings would be stronger if they were inserted as one homogeneous mass, and not separated into an approximal and crown filling. In my practice, before final condensation of the combination of tin and gold, I incorporate into the mass a cylinder or two of cohesive gold. These are held in place by interdigitation, and expose on the surface cohesive gold to which more cohesive gold can be added.

Dr. CRENSHAW. I have never done the kind of work indicated by Dr. Hart. It may be a good idea. There are those whom I have no doubt can, and will, make various combinations of filling

materials and probably get better results with the matrix than I have. For the fillings such as I have spoken of in my remarks, I believe the combination of tin and gold is better than the filling entire of gold; and if a patient leaves this to my judgment that is what I do. I do not believe there is electrolysis of the tin—electrical decomposition of the tin—under gold in the mouth; but if there is, it does not detract from the value of the tin.

In the filling of molars and bicuspidis there is one use of the matrix already mentioned which I wish to emphasize. Take the class of cavities, either in the upper or lower jaw, where they extend down beneath the gum line so far that you cannot fix the dam below its margin. Prepare the cavity and place this device in the mouth, putting a roll of absorbent cotton under the nuts inside of the arch and beneath the tongue, and a roll on the buccal side. Now dry out the cavity well with several pellets of absorbents, having your gold and instruments ready. You can build in this wall of soft gold or of tin to the top of the step in ten or twelve minutes, and you will find that the absorbents placed there will afford protection from the saliva, especially if a saliva ejector be used, for from twenty minutes to half an hour. You can then remove the matrix, put on the dam, dry off the surface of the gold or tin, and proceed to finish the filling with cohesive gold in the regular way. This method can be followed in making amalgam fillings, only you will have sufficient time to build up the largest of them and get the proper contour and condensation before there is danger of the cavity becoming wet without the dam.

Another operation to be performed with this device is of tin and amalgam.

Following the line of procedure indicated in the previous operation for keeping the cavity dry, I pack tin foil cylinders or cushions into the approximal wall of the cavity and cap with amalgam. This operation, so far as I know, is original with me, and I believe it will prove a valuable filling. It has been asked if the mercury in the amalgam will affect the tin. I will say that I do not think so; there is no disintegration or softening of the tin on account of the contact of the tin and amalgam. You can do this work in the lower and upper jaw and in mouths where the flow of saliva is profuse, depending with safety on the absorbent material to keep the filling dry for the required length of time, and of course without the use of the dam.

I think it probable others will be able to get better results from the use of this device than I have, but I have been so pleased thus far that I have been satisfied to rest at this point for the time being.

Dr. Gaylord has reported very satisfactory results from his use of the matrix, and has been very kind in his words of praise of the working of it.

Dr. B. HOLLY SMITH, Baltimore. I have had some experience with this matrix, and I want to say that it has relieved my mind as to some of the most dreaded work in dentistry. I have always thought that a thing which was easy was not to be sought, but here comes a man from the South and offers to the dental profession a little device which circumvents many of the difficulties in the manipulation of gold in the filling of teeth. I want to say that my experience with this matrix has been very pleasant; I am very proud of some of the work I have done with it, and I give Dr. Crenshaw credit for having suggested

something to me that has made my life happy. I can do dentistry better because I have the matrix. There are, however, some peculiar conditions that I meet which are still extremely embarrassing to me. For instance, where the approximal walls have been broken down to the gingiva, I would still like to make use of the matrix. I would like to be able to apply the matrix and build that out to the proper knuckle at the approximal surfaces, but I have not yet accomplished that. I have not found it of universal advantage to me in my practice. I have not been able to get universal results with it, but hope to do so with practice.

With regard to my friend Dr. Hart's suggestion of the combination of semi-cohesive gold to facilitate the union between the tin and the gold, I have no faith whatever. The union is doubtless a mechanical one and can always be completed, and you do not want any semi-cohesive gold there. Dr. Crenshaw says he would not use any but the non-cohesive gold and the cohesive. There is no other. Gold that can be made cohesive by annealing is nothing but cohesive gold. As soon as you impart to the gold one iota of the properties of cohesive gold you have cohesive gold. You can make non-cohesive gold as absolutely homogeneous as cohesive gold if you will spend the effort on it.

Dr. CRENSHAW. Dr. Smith's remarks about the matrix not being adapted to certain conditions are true. I do not claim that it can be made to meet them all, but I will say that in conditions where the walls he speaks of as being broken down to the gingival margin are definable, the matrix is applicable.

The soft gold I am using is called non-cohesive, and is so practically; it is susceptible of being made cohesive, but you cannot weld it until it is annealed, and it is therefore practically non-cohesive gold.

Dr. SMITH. Does not the friction in the working of it make it cohesive? It has been shown that it has the qualities of cohesive gold when annealed, and the friction of motion in working it will impart to that semi-cohesive gold the very quality which you do not desire.

Dr. CRENSHAW. I catch Dr. Smith's idea. It may develop more of the quality of cohesion than I know of in its working, but I think he is confounding the stiffness and hardness resulting from the working of the gold with cohesion. About this, however, I do not certainly assume to know.

The subject was passed, and Dr. E. J. ROBERTS of Augusta, Me., read a paper entitled "The Science of Nitrous Oxid Anesthesia," as follows:

THE SCIENCE OF NITROUS OXID ANESTHESIA.

By E. J. ROBERTS, D.D.S., Augusta, Me.

THE science of nitrous oxid anesthesia is understood by but a few, and I think that, even of the few, all are not fully agreed in what the science consists. Certainly the large body of dentists, of whom very many are proficient in the various lines of dentistry, are in the science of nitrous oxid anesthesia very imperfect. They for the most part assume to be wise, and in speech are very profound, but in practice are merely mechanical, and do not explain correctly the various phases which appear in the administration of the gas, observing only outside manifestations and having no definite knowledge of those within. Fortunately for all concerned, nitrous oxid is a wonderfully safe agent; were it not safe, even the best of us would not care to employ it.

The object of this paper is to present as far as possible a clear analysis of nitrous oxid anesthesia, which will be largely from a chemical basis. Very many of our applicants to practice dentistry are deficient in a clear theory of nitrous oxid anesthesia, and are equally deficient in a knowledge of chemistry.

The outline history of anesthesia is very interesting. In the thousands of years of the world's history from the

creation to the present time, so far as we know anesthesia remained unknown, and not until within the memory of many who live to-day has it been in use, and to our senses it is indeed a surprising and a strange realization that we remember the time when anesthesia was unknown. We are proud as a profession that we hold the high distinction that from our ranks was made this wonderful discovery.

Dr. Wells, a dentist of Hartford, Conn., on December 11, 1844, discovered anesthesia in nitrous oxid. This marks the beginning of anesthesia. All honor to Dr. Wells!

September 30, 1846, Dr. Morton, a dentist of Boston, introduced to the world that grand and magnificent agent, ether, as an anesthetic—the greatest boon that ever came to man for the alleviation of physical suffering.

The conception of anesthesia seems to have had its practical beginning when Dr. Mesmer, a Swiss physician, produced a profound sensation in Paris in 1778, through mind operation, by obtaining control of the will and action of his subjects, and in many cases his patient could be made fully unconscious of pain or of surroundings. This phenomenon was termed mesmerism.

An appointed committee of investigation reported a disapproval of Dr. Mesmer and his science, and the matter fell into disrepute until 1842, when Dr. Braid wrote quite a scientific work upon hypnotism, and the idea of anesthesia was revived. Our Congress voted an award to the discoverer of anesthesia who would find a safe and efficient anesthetic, but by reason of dispute as to whom the honor belonged, that award never was paid.

The study of hypnotism I have myself found very interesting, though it is as yet unreliable. In a few cases, in subjects whom I had previously developed, I produced a profound sleep and retained it at my will, and performed severe operations upon the teeth. Hypnotism is the ultimate of magnetism, and magnetism is a degree of hypnotism. All of us instinctively use magnetism, which is so helpful to ourselves and also for our patient. If we have a knowledge of the principles which promote it, we can use magnetism more successfully.

The most widely used general anesthetics are—

First, *nitrous oxid*, which was the first to be discovered, and which marks the beginning of anesthesia.

Second, *ether*, which for safety and efficiency is the best of all anesthetics for general surgery. It is used by dentists in difficult and protracted cases of extracting teeth. Some dentists use ether exclusively.

Third, *chloroform*, which was discovered in 1847 by Dr. Simpson, an eminent physician in England. This agent is prompt, and is attended with a degree of danger. The danger consists in the fact that it affects the motor nervous system almost simultaneously with the sensory nerves.

Cocain has in a great measure displaced the use of nitrous oxid and ether in our practice.

In most cases of ulcerating and inflamed gums the injection of cocain is painful, and in many such cases it fails to produce the desired result.

Nitrous oxid, when it is properly prepared and intelligently used, is very agreeable; the administration is easily managed. It is wonderfully safe, and is prompt in effect; anesthesia is perfect; all is satisfactory both to operator and patient, and ordinarily there is no struggle, or rigidity of muscles. Cyanosis is exceedingly slight and often is not perceptible, and the mouth-prop is not a necessity, as the mouth can easily be forced open. I claim all this for nitrous oxid when it is *pure* nitrous oxid. Children of tender years and delicate condition, old people, and, in fact, people of all ages and of almost any condition, are able to inhale it with pleasant effect. Pure nitrous oxid and properly washed is fit for use at the moment it is taken into the receiver from the retort, and when properly kept it is equally as efficient at the end of a month.

That all these agreeable results may obtain, I prefer to generate for myself the gas I use. Why is it that cyanosis, rigid muscles, tetanus, and convulsive effort appear in the patient? Why was it, when dentists generated gas for themselves, that often there were frightful exhibitions in gas administration, so much so that the ordinary dentist felt a terror every time he was called upon to make use of it, and under all the various conditions which ensued the dentist never was sure what result was in store for him, so that many in consequence abandoned its use?

Dr. Wells had only partial success, and

yet, could he have known it, perfect success was almost within his grasp. Probably the admixture of too much air was the greatest difficulty. The carbon dioxide was exhaled into the gas-bag and re-inhaled, and possibly with some admixture of nitric oxide, and thus nitrous oxide, nitric oxide, carbon dioxide, and air made up a combination of variable mixtures which produced the widely variable range of results. For these reasons nitrous oxide did not come into general use until 1863, when by an organized effort a rude outfit was put into nearly every dental office in the country, and probably in every office these same results were repeated, and many a blundering dentist discontinued the use of nitrous oxide by reason of the frightful results which occurred. In 1868, better instruction and improved apparatus prevented the use of gas from being wholly abandoned. The intelligent dentist made it a success, and others made many failures. By the introduction of manufactured liquid gas many failures were avoided. I have not used liquid gas in my practice. From all I could observe, I saw no advantage in making the change. It was not more efficient, and there is no special difficulty in generating gas, and at that time liquid gas was very expensive, and later I came to regard gas generated by myself as superior to liquid gas. I suspect the presence of a small amount of nitric oxide mixture in the liquid gas, not enough to injure results, but enough to present in a slight degree some of the annoyances which ensue from the presence of nitric oxide.

Since 1901 I have been one of the dental examiners for Maine, and have taken as my part of the work chemistry and anesthesia. Examinations at first were conducted orally and then changed to

written questions and answers. In these examinations I have been very much surprised at the indefinite knowledge in chemistry and of nitrous oxide.

I am not much of a chemist, but I do believe it to be important that in the medical profession its members should possess a knowledge of first principles in chemistry. There is nothing in all nature of a material character but possesses a chemical formula, chemical action and change, and without a definite knowledge of these first principles we are quite at sea in almost everything; and why should we not in our specialty be ready to speak and act intelligently!

To repeat a few formulas does not imply a knowledge of chemistry. On examining a work on chemistry, it does indeed appear formidable, and to my own mind the books are unsatisfactory. An elementary school book on chemistry for our purpose is quite sufficient.

Question 5 (1) What is an element?

(2) What is an atom, and a molecule, and the difference between an atom and a molecule?

(3) What is valence? What is a chemical compound, and what is the difference between a chemical compound and a mixture?

I have met a good many dentists, dental graduates, who were unable to answer these three items intelligently; and yet these are simply the A B C in chemistry. If these be thoroughly understood, and also what constitutes an acid, a base, a salt, and a radical, we are then prepared to single out such elements as enter into compositions of which we as dentists have need.

Chemistry in outline is quite simple: We say that in all nature there are some seventy elements, but we lay aside, how-

ever, the larger portion of them and call them metals; we need study them only as they become necessary. This planet and all it contains—air, water, earth, vegetable and animal—are composed principally of five elements—oxygen, hydrogen, nitrogen, carbon, and silicon. Take away all oxygen, hydrogen, and nitrogen, and this vast ocean of air and all waters would be gone; all wood and vegetable would shrink to charcoal; the soil and all rock formation would shrink also, being forty to fifty per cent. oxygen. Then take away all carbon and all manner of wood and vegetable would disappear. Then take away silicon, and nearly all that remains of earth and rock would go, and what would then be left, and how much bulk would it make? Enough to make an asteroid?

This much knowledge in chemistry is simple and important. Abstruse chemistry consists of the multiplicity of compounds of the various elements, which is quite unnecessary for our study, other than the specialties in which we are interested. And nitrous oxid is a specialty which we need to trace out.

I ask this question: The air we breathe is nitrogen and oxygen. N_2O is nitrogen and oxygen. We breathe one and retain consciousness; when we breathe the other we lose consciousness. Why is it so? The answer usually is N_2O is an anesthetic, and there the answer ends, but, allowing that N_2O is an anesthetic, I do not consider that the question has been met.

A collateral question is then asked: Do we have free oxygen in the air? Very many do not know. I ask, Is air a mixture or a compound? and likely as not the answer will be, It is a compound. In air we have a volume of free oxygen 21 parts to 79 parts of free nitrogen, and in

our study of nitrous oxid we must know this fact.

As we inhale air, the free oxygen is absorbed into the blood corpuscles and conveyed to every minute portion of the body. Food, which is principally carbon and portions of other elements, is taken into the stomach, and after proper preparation is conveyed into the circulation. This food through the action of oxygen is transformed into the various tissues, the change taking place in the capillary system. The capillary system is present in every minute portion of the body. By this process we retain life and consciousness. The tissues are constantly wasting, having served their purpose, and new tissue is constantly being supplied. When the oxygen meets this waste tissue, combustion ensues, and by this combustion heat of the body obtains. In this connection I ask, How does heat of the body obtain? I usually receive an answer very short of the question, such as this, "Heat obtains in the body from the food we eat," with rarely a word as to the process. I rank such answers 2 or 3, when it requires $7\frac{1}{2}$ to pass.

The product of this combustion is CO_2 , carbon dioxide, which returns to the lungs and is expelled.

I hold a piece of wood and ask what the principal element of it is; not every one has a ready answer, but we finally agree that it is carbon. Again I ask, Does this dry, seasoned wood contain water? The nature of such a question suggests that possibly it does. When I say, "Charcoal is pure carbon," then the answer comes quickly, "I see," and we agree that this dry wood is a hydrocarbon.

"But what has all this to do with my examination as a dentist," the applicant asks of me. I reply, "I wish to know

whether you understand oxygenation and the formation of carbon dioxid, and how heat obtains in the body." Place this wood in a fireplace and put flame under it, and immediately there is union of oxygen from the air with the carbon, and heat is thrown out, and carbon dioxid is formed and goes up the chimney. The combustion in the fireplace and the combustion of tissue in the body are as almost precisely alike.

The symbol of nitrous oxid is N_2O . It is a chemical compound, and this constitutes the difference between it and the oxygen and nitrogen of the air, which is a mixture, and when inhaled it is absorbed by the blood but yields no oxygen, as it passes the round of the circulation and returns to the lungs pure N_2O . The oxygen which is in the body is soon exhausted and anesthesia ensues. It is an inevitable result.

Pure N_2O is non-toxic, it is perfectly inert, and the anesthesia is so placid that one can barely believe that it is anesthesia, and can know it only by experience. There is no rigidity, excepting in the case of hysteria, and we cannot be accountable for what may appear in hysteria. Hysteria is not dangerous, but is sometimes unpleasant to manage. The patient under pure N_2O has no convulsion. There may be some involuntary movement while teeth are being extracted. The mouth is easily forced open, hence not much use for a prop. There is no discoloration, or very little, in the face. At the beginning there is oxygen already in the circulation, and from this a portion of carbon dioxid is formed, which, coming into the lungs, may be, and usually is, reabsorbed. This produces the slight discoloration which sometimes appears even when the gas is pure N_2O .

Ordinarily, for successful anesthesia

all air must be excluded, and in the absence of oxygen entering the lungs the blood absorbs the N_2O . The blood has equal attraction for carbon dioxid, and reabsorbs CO_2 with the N_2O . Oxygen is the tonic by which the patient is restored, and he very quickly recovers by taking it from the air.

I do not understand that there is any necessity for a cylinder of pure oxygen. If one is using a bad quality of gas, a little draught of oxygen is a good thing, and a little inlet from the air will furnish the supply. I will say in passing that a few patients will need a small amount of air in cases when breathing breaks up too quickly, as they are not yet in complete anesthesia, and inhalation needs to continue to insure the result. The only contra-indicated patient is one with a badly degenerated heart.

In my experience in generating nitrous oxid, I observed that whether it was done slowly or rapidly, in the same proportion it appeared in the patient. When generated slowly, the patient was equally mild; if there was a degree of rapidity, then there was the same degree of turbulence in the patient; when made rapidly, the patient was turbulent, and here and there a case would appear which took on frightful indications. I have learned to generate nitrous oxid slowly.

Chemistry teaches us that from the same retort, by excessive heat the product will be a mixture of N_2O_2 with the N_2O , which is another chemical compound. I judge by experience and observation that if while generating N_2O there are puffs of the nitric oxid thrown up, then we have two gases mixed, just as the oxygen and nitrogen of the air are mixed, or as peas and beans in the same bag are mixed.

It is a law in chemistry that when elements combine to form a compound, that compound has a nature peculiar to itself, and may not in the least resemble the nature of the elements which compose it. A mixture of milk and sugar resembles its components, because it is a mixture, but not so with chemical compounds. For instance, H_2O , which is water, is composed of hydrogen and oxygen. Hydrogen is highly inflammable, and oxygen is a supporter of combustion, but the combination of the two gases forms water, and water is used to extinguish fire.

We study ether anesthesia from a physiological standpoint for the reason that it is a local obtundent to nerve tissue which is systemic, because nerve-terminal tissue is present in every minute portion of the body.

Nitrous oxid is an anesthetic as well as ether, differing in that it obtunds nerve tissue from *lack* of oxygen. The nitric oxid has *its* peculiar effect, as observed in rigid muscles, set jaws, and convulsions.

I attribute deep discoloration to the liberation of the oxygen of N_2O_2 . All goes well with the patient until anesthesia obtains, and just at the moment we desire to operate, and the tissues have become hungry for oxygen, the N_2O_2 breaks up and violent combustion ensues, and all the concomitants follow. There being

no oxygen in the lungs, the blood absorbs the returning carbon dioxid as readily as it does nitrous oxid, and thus we have cyanosis. To obviate this I prefer for my own use to generate gas the quality of which I am assured is pure and does not contain even a perceptible trace of N_2O_2 .

One other difficulty sometimes enters into the administration of N_2O ; there is a failure or a partial failure to obtain anesthesia. and someone rises up to say the gas has lost its strength; but as nitrous oxid is a definite compound it does not and cannot lose strength. It can be diluted with air, and if the patient receives enough air, anesthesia will fail. If there be no admixture of air, anesthesia will be positive; it cannot in the nature of things fail. There can be no idiosyncrasy to cause a failure. Usually, where there is a little leakage of air, anesthesia will ensue by continued inhalation of gas, and in a few cases the patients need a little inlet of air to enable them to inhale a sufficient amount of the gas.

My effort has been to show what a beautifully working agent pure nitrous oxid is—charmingly pleasant to the patient and highly satisfactory to the operator—and that it is safe, prompt, and efficient. I have pointed out the difficulties and the way to avoid them, and when difficulties enter in, how to understand them quite perfectly.

DISCUSSION.

DR. L. C. TAYLOR, Hartford, Conn. After a brief introduction, the author states that—"The object of this paper is to present, as far as possible, a clear

analysis of nitrous oxid anesthesia, which will be largely from a chemical basis." He refers to the history of anesthesia as being interesting and as unknown until

within the memory of some now living. From a practical standpoint this statement is true; but from a theoretical standpoint, anesthesia has been known for two hundred and fifty years.

After a short discussion of how nitric oxid is liable to occur in home-made gas, he comes to the primary of his paper, seemingly to see how far the dental profession desires procedure along the line of chemistry, and asks (1) What is an element? (2) What is an atom? a molecule? and the difference between an atom and a molecule? (3) What is valence? What is a chemical compound? What is the difference between a chemical compound and a mixture? The foregoing he calls the A B C of chemistry. The value of the above in an examination to practice dentistry will be considered by different practitioners according to their previous education.

Here he returns to his chemistry, and speaks of nitrous oxid as a specialty which we need to trace out. He then proceeds to discuss the component parts of air; the waste tissue in the body from combustion,—with another complaint that the applicant has not answered in value of more than 2 or 3, when it requires $7\frac{1}{2}$ to pass, and complains of the applicant because he asks, "But what has all this to do with my examination as a dentist?" While all this may be valuable in its place, I am inclined to think it irrelevant, if the true motive of this paper is, as he has stated, nitrous anesthesia from a chemical basis.

He says, "I have learned to generate nitrous oxid slowly." "Chemistry teaches us that, from the same retort, by excessive heat the product will be a mixture of N_2O_2 with the N_2O , which is another chemical compound." Here let me say that the proportion of nitrous oxid to

nitric oxid will be as the proportion of time of slow heat to excessive heat + the ratio of rapid generation. It is absolutely impossible to make nitrous oxid with excessive heat, and it is also impossible to make nitric oxid with slow heat; hence the value of modern apparatus such as is used by our liquid gas manufacturers, as compared to the cheap office outfit. Should a man have a considerable practice he can ill afford to devote the time to making gas, and to trust it to the office-boy means that when he wants to go out it will be hurried up, and the gas, instead of the harmless nitrous oxid, will be the poisonous nitric oxid.

There are so many valuable things pertaining to our profession that it seems to be rather antiquated to be advocating the manufacture of one's own gas. The value of time wasted to produce a good article would not net a man twenty cents per hour, to say nothing of expense and cumbersomeness of apparatus.

Dr. JAMES McMANUS, Hartford. I enjoyed Dr. Roberts' paper very much, and think that he has brought out a good many very valuable points, probably some that few of us here have thought about. With reference to the history of anesthesia, its discovery, etc., I think that Simpson is the only man worthy of mention in this connection besides Dr. Wells. The men Morton, Jackson, and several others were simply quacks with dishonest claims.

Dr. Roberts' method of preparation was a point that I was well pleased with, although Dr. Taylor seemed to take exception to that. I think Dr. Roberts simply wishes to be sure that the gas he uses is absolutely pure; the question of whether he makes any money out of it or not, I do not think entered his mind at all. The making of one's own gas can

be done to-day, and I was rather pleased with the doctor's suggestion.

The subject was passed, and the secretary read the following applications for membership:

Dr. Frederiek S. Parsons, Thomaston, Conn.; Dr. Clifford James Hill, Waterbury, Conn.; Dr. P. F. Kumpitsch, Hartford, Conn.

On motion the secretary cast one ballot for all three applicants and they were declared duly elected members by the president.

The president then named the Nominating Committee, as follows: Drs. E. S. Gaylord, Crosby, and Gibbs.

Motion to adjourn was made and carried.

TUESDAY—Evening Session.

The meeting was called to order at 8.30 o'clock by President Eberle.

Dr. I. N. BROOMELL of Philadelphia, by the aid of the lantern showed some beautiful specimens of sections of the jaw made by himself to illustrate the development of both the temporary and permanent sets of teeth. He showed the earliest forms of the tooth-follicles in their embryonic stage and followed out the development of the teeth to their

eruption. He also showed the absorption of the roots of the temporary teeth and the development of the permanent teeth from the early stages to eruption. Dr. Broomell showed slides illustrating the comparative anatomy of the teeth of man to the lower animals.

There being no discussion of Dr. Broomell's lecture, the society then listened to a paper by Dr. WM. H. METCALF, New Haven, Conn., as follows:

NERVE LESIONS: THEIR ETIOLOGY FROM A DENTAL STANDPOINT.

By WM. H. METCALF, D.D.S., New Haven.

IN presenting to you so broad a subject it is incumbent upon me to explain that, owing to the time limit of such a paper, it must necessarily be treated synthetically and not strictly from the point of view of the scientist, be he anatomist, physiologist, or pathologist.

The investigation of the collateral sciences and their many and varied ramifications best serves the student through the medium of his own particular specialty, therefore it seems to be our mission as dentists to dissect this subject principally along the lines of dental experience. No profession, perhaps, offers better facilities than ours for such investigation; in fact, I might truthfully say that, working as we do upon subjects who are comparatively healthy as well as upon those who are diseased, and coming into such close contact or association with the nerves of sense and feeling, we have thrust upon us most exceptional opportunities for scientific as well as artistic research. The proof of this is manifest when we reflect upon the rapid advancement of dentistry as a scientific profession, and upon the many improvements in its methods of practice. Yet, gentlemen, how true the old aphorism, "There

is nothing new under the sun," for we are, after all, not inventors, but mere adventurers; not originators, but explorers—discovering, or unraveling, as it were, Nature's beautiful fabric and striving in this way to understand her methods of weaving; alas, how unsuccessfully!—for do we not, in our inspection of the woof, often entirely forget the warp, thus totally destroying the design?

To get a more intelligent conception of nerve lesions, and to more accurately trace their intricacies and complexities, we should first look for a moment into the apparent nature of normal nerve structure or force, beginning our pilgrimage at the cell.

The normal tissues of the body are made up, as it were, of cells, or groups of cells, each tissue having its characteristic group. Nerve cells respond to stimuli through the afferent system. These stimuli all act as irritants, and are classed in our physiologies as mechanical, chemical, thermal, and electrical; the latest theories including also a force or influence emanating from the will.

These cells hold "stored energy," and are so constructed or organized that they will readily respond normally to stimuli

When stimulus is more than normal the vital force of the cell is exhausted, and the converted energy fails to react. On the other hand, when stimulus is less than normal, as in the case of a structural defect interfering with physiological action, the result is invariably a lowering of the stored or potential energy of certain groups of cells, directly connected, and sometimes in a reflex way with the lesion. In other words, the power of resistance of a cell depends upon its structural relations with its fellows, any defect of continuity, of course, lessening its power of storing vital force and giving off its converted kinetic energy. Yet this same kinetic or resultant energy, if normal, may be, or is, an occult force in nature, which supplies new energy through waste, as the earth gathers momentum, perhaps, in its endless journey through space, or as the wheat germ will spring into life and growth, after a dormant existence in some sarcophagus for a thousand years. Briefly, to give metabolism the attributes of perpetual activity and life negatives the essence and meaning of both its name and functions. That is, if we agree that anabolism means the building up of the body elements, and katabolism the breaking down of certain elements during the changes preliminary and incident to assimilation and nutrition, then, as death ends the process, we are compelled to admit the cessation of an outside dependent energy, which seems to prove the supposition. Granted, then, that the vital essence or principle comes from outside the cell, it goes without saying that the cell is formed for the reception of that force, and not the force for the cell. It would surely sound better to say that man was made to receive the Divine love and wisdom than to reverse the proposi-

tion. The cell, then, being made to receive and operate this outside energy, it follows that it must be of normal size and shape and in perfect working harmony with its surroundings; when it is not, we speak of the condition as disease, or abnormal anatomy, and if you will pardon the term, perverted physiology.

Nerve lesions, then, are pathological, and their etiology embraces two causes, which may be classed as internal and external. As dentists the external causes concern us most, for of the nature and working of internal causes, advanced medical science has as yet shown us but little that is of use.

Insanitation is perhaps the best word to express the nature of outside causes of nerve atony. This includes uncleanness, and admits the presence of the much dreaded micro-organisms. Malnutrition is, I presume, the most appropriate term to express the internal causes.

We have, then, in the cursory scanning of the field, noted that when the causes of nerve lesions are from within, metabolism should be promoted, and a condition of perfect nutrition should, if possible, be established. If from without, then the most modern prophylactic, disinfectant, and antiseptic measures of sanitary science should be adopted.

It occurs to me at this point of my reading that I may possibly be misunderstood when making the statement that nerve lesions are the result of perverted physiology or disarranged anatomy, for this would imply accident, and this is of course not always the case. Disease not always, but generally, involves a question of individual responsibility. The human body is a personal trust, and when function is abused disease finds easy entrance. To avoid disease then, or nerve lesions, we must not only look for abnormal

anatomy but for functional disorder as well, for it is the latter which the most frequently brings about disease. Each human body needs an engineer with a well-balanced judgment to run it properly. Many errors of the past treatment of disease or of lesions may be laid, I think, to the non-belief in this personal responsibility theory—namely, that every man is the arbiter of his own physiological and functional economy. The dentist should be a doctor in the full meaning of that term—a teacher and a counselor. In other words, he should endeavor to show his patients that disease is not an entity, but the absence of health; that the human machine is made to respond to intelligent management with normal functional activity, and that abnormal functional activity exhausts and deforms the organ.

Then again, while the individual is practically the architect of his own destiny, he nevertheless is but an atom in the great sea of humanity, and must necessarily be, to a great extent, influenced by the condition of the whole. It behooves us, therefore, in exercising the personal care and responsibility for health, to also do our best to educate our patients and the masses into the correct ways of thinking about themselves, and their wonderful privileges and possibilities.

But I can seem to hear some of you say, How about the practical side of this question of nerve lesions, that side which concerns us as artisans and mechanics? How about the nerve lesions in and about the teeth?

Gentlemen, after all, this *is* the question which concerns us the most, touches us the nearest. Many of you have been practitioners much longer than I, and without doubt have noticed and noted

more; but after about twenty years of dentistry, I have come to the conclusion that the many disturbances connected with tooth-structure and their etiology may be summed up as almost invariably coming from one cause, viz, early neglect; or, in other words, that the teeth of children have not been scientifically cared for.

Beginning at the cradle, with proper food, correct environment, and hygienic care, the deciduous teeth should be saved, if possible, until the eruption of the permanent teeth, thus making nerve lesions and abnormalities much less likely to occur. It seems to me that the coming study for both dentists and physicians is physiological chemistry; not that which has direct reference to drug effect, or therapeutics in the medical sense, but the true animal chemistry of the body itself, as it demonstrates itself through normal and abnormal glandular action, cell proliferation, assimilation, nutrition, and metabolism.

One of the many causes of malnutrition of the second or permanent teeth is, I think, the premature extraction of the first teeth. Think for a moment of the delicate adjustment, arrangement, and *modus operandi* of nature in the cutting, or eruption, of the permanent teeth! Think how volcanic, how traumatic, how iconoclastic, the brutal extraction of the baby teeth must be! How it must suddenly arrest the nutritive activity of normal anabolism! How it must tax the recuperative powers of the surrounding parts, at the expense of the new, or permanent, teeth in their marvelously delicate processes of formation, nutrition, and growth! Think of the numerous complex abnormalities which possibly may be traced either directly or indirectly to this cause: directly, as in dental

malformations and irregularities, and indirectly as in the high arch, deflected septum, and possibly hypertrophied tonsils, adenoid growths, and the many resultant and sometimes serious deteriorations of the branches of the fifth pair and their reflex influences.

When we properly understand the subtle chemistry of body metabolism, as it relates to the restoration and repair of nerve lesions, and their consequent structural defects; when we more fully comprehend the marvelous and insidious workings of cell action and reaction, as influenced by the more marvelous circulatory or fluid supply; when we begin to get intelligent glimmerings of the true or inmost nature of the various stimuli;

or, to be brief, when we can treat diseases by the same means, or means of the same character as those which produced them, —then we may truly call ourselves physicians and dentists. The past history of both medicine and dentistry shows much that is noble, progressive, humanitarian, and undeniably true; but alas, after all is said, how little we really know about the real workings of animal physiology, and, as dentists, how little about the real nature of dentition!

In view of these facts and surmises, is not the proper care of and attention to the children's teeth one of the most important problems before the dental profession to-day, with a view to the ultimate improvement of the race?

DISCUSSION.

Dr. E. S. ROSENBLUTH, Bridgeport. The essayist is certainly entitled to a great deal of credit for the able manner in which he has presented the subject, and I must say that it is a very difficult one for me to intelligently discuss. The thought occurred to me, however, that we have certain advantages in dentistry in the treatment of nerve lesions which are exceptional, and that is, that in working within the tooth, if we are unable to subdue the trouble we can remove the pulp. One of the disadvantages appears to be that if we desire to preserve the life of a pulp, it is usually found impossible; this is probably accounted for by the hard condition of the structure which incloses the pulp and renders it unable to find any relief in case of inflammation; this causes expansion of the pulp and consequently the blood supply

is cut off and the pulp dies in spite of all our efforts to save it. Within the tooth we have no collateral circulation to help maintain life. Outside the tooth we may cut several nerves in cases of nerve lesions and still find that the parts will return to life with proper blood supply.

The ruthless extraction of the deciduous teeth, while no longer common, cannot be too strongly condemned. With the means now at our command the teeth of children can be cared for properly by the exercise of patience and kindness for the little ones.

Dr. JOHN I. HART, New York. Assuredly, as the essayist has indicated in a very able manner, many of the reflex neuroses and direct irritations are caused by want of proper attention to both the temporary and permanent teeth. I think

that the work that has been done by your fellow townsman, as well as that suggested by Dr. Smith of Philadelphia, has assisted us in correcting the ravages due to want of proper attention to the teeth. Surely we, as dentists, can mitigate by proper prophylaxis the ravages of bacteria as well as the irritations about the teeth which produce so much intestinal and gastric indigestion; and as we care for and assist our patients in caring for the buccal cavity, so will we be rewarded in the growth and development of the individual. We have seen the marked amount of good which has been made possible where the nose and throat men have removed adenoids, and in a few weeks the patients have gained many pounds owing to proper oxidation. Now, if we can assist in keeping the oral tract clear, so that the tissues and secretions around the teeth are healthy and the teeth do not collect around them the débris which improperly kept mouths are bound to retain, I am sure that many of the disorders which we have had our attention called to will disappear.

Dr. METCALF (closing the discussion). I would like to say a few words in regard to the dentist co-operating with the

physician regarding this matter of the preservation of the deciduous teeth. I know that probably there are many present who are familiar with the fact that physicians give the teeth very little attention. I recall a chat with a very intelligent physician, a rhinological specialist, who seemed somewhat surprised when I suggested that probably the premature extraction of the deciduous teeth must affect the normal eruption of the second set; and I must admit that I was surprised myself to think that such a man, who constantly treated the surrounding parts, should be ignorant of the fact that such extractions tended to contract the arch, thereby interfering with metabolism and the incident eruption of the second teeth. I am very glad to have this occasion to emphasize publicly the unfortunate fact that physicians seem to be so thoroughly ignorant of the necessity for the preservation of the deciduous teeth. It seems to be the duty of the dentist to co-operate with the physician in advising parents regarding the importance of the care of the deciduous teeth.

A motion to adjourn was then carried.

WEDNESDAY—Morning Session.

The meeting was called to order at 10 o'clock by the president.

The following applications for membership were read: Dr. John Jarvis Haskell, Hartford; Dr. John Louis Sullivan, Willimantic; Dr. W. E. Boucher, Hartford.

On motion the secretary cast one ballot for the three applicants, and the presi-

dent declared them duly elected members.

The president then extended an invitation to all present to visit the Central Congregational Church and see the memorial window that had recently been dedicated to Dr. Horace Wells.

Dr. F. D. WEISSE of New York then read a paper on "Epulis," as follows:

EPULIS.

By FANEUIL D. WEISSE, M.D., New York City, N. Y.,

PROFESSOR OF ANATOMY, SURGICAL PATHOLOGY, AND ORAL SURGERY, NEW YORK COLLEGE OF DENTISTRY.

THIS name is given to the neoplasms of the gum areas—fibroma, sarcoma, and osteosarcoma.

Frequency. McCurdy in his "Oral Surgery" quotes from Dr. Larabrie that of 1156 tumors examined by him in eleven years, from all parts of the body, 32 were epulis. This series would thereby establish epulis as occurring once in thirty-six tumors of all kinds.

Location. The inferior and superior arches are relatively involved in the proportion of two-thirds to one-third of cases.

Sex. Cases occur relatively in females and males in the proportion of five to three cases.

Age. The range of cases is from childhood to old age, but one-half of all cases occur before thirty years, and two-thirds before forty years.

Symptoms. A single nodule of the gum area: varying in size from a bead to a hickory nut, or larger; springing from an interproximal space between teeth or an alveolus containing a root of a tooth; covered by normal mucous membrane which may be somewhat purplish in color; pedunculated, involving one surface of the gum only, or non-pedunculated, involving one or both surfaces

of the gum; of slow growth, if of any size having a history of several years' duration; may separate the teeth an eighth, a quarter, or even half an inch; at times may include a root and even a tooth, dislodging it; may be ulcerated if caught in the occlusion of the teeth; and may be recurrent, cases presenting that have been removed several times and have developed again.

Etiology. Devitalized teeth whose pulp-chambers and root-canals have not been emptied of their necrotic contents and the teeth treated and filled, and retained roots—such tooth-conditions producing irritation of the gum or alveolo-dental membrane, thereby initiating the neoplasm. It is also possible that in some cases an accidental and unnoticed injury of the gum or alveolo-dental membrane may initiate the neoplasm.

Pathology. The pedunculated forms that spring from an interproximal space between teeth and involve one gum surface, or that spring from an alveolus containing a root, have proved in my experience to be fibroma. I am inclined to regard this variety as having its origin from the deep gum tissue in the former case and from the alveolo-dental membrane of the alveolus in the latter case.

The non-pedunculated forms, involving one or both surfaces of the gum, springing from an interproximal space, and spreading the adjacent teeth apart, have in my experience proved to be sarcoma with giant-cell constituents, and sometimes they also contain some osseous tissue cells, constituting them osteosarcoma. I regard this variety as having its origin from the alveolo-dental membrane. It is sometimes stated that epulis—fibroma, sarcoma, and osteosarcoma—originates from the periosteum of the free surfaces of the alveolar process. I have always held that the free surfaces of an alveolar process are not covered by periosteum, the alveolar process being only a temporary osseous scaffolding for the support of the temporary and permanent teeth respectively, not present before the eruption of the temporary teeth but developing only as the need of tooth-support is required and disappearing by absorption when the permanent teeth are lost. This life-history of the process proves that the presence of the alveolo-dental membrane is essential to the presence and perpetuity of the process. If the free surfaces of the alveolar processes were covered by periosteum the structure would not be absorbed as rapidly as it is after the loss of the teeth and their alveolo-dental membranes.

Prognosis. I have yet to see an ultimately fatal issue of a case of epulis—fibroma, sarcoma, or osteosarcoma. This leads me, when a case presents, to dispel the anxiety of patients even where the structure of the neoplasm is determined to be that of sarcoma or osteosarcoma. It is to be remembered that the sarcoma containing giant cells is the least malignant variety of the sarcomas, and the presence in the neoplasm of osseous tissue formation is not at all serious.

Again, that the situation of the neoplasm is in a temporary scaffolding structure—the alveolar process—and that the growth having perfect freedom to protrude into a cavity, it does not bed, so to speak, so as to involve the body of the inferior or superior maxillary bone.

Prophylaxis. Remove the conditions favorable to the development of epulis by impressing upon patients the necessity of extracting roots of teeth and of having devitalized teeth emptied, pulp-chambers and root-canals freed of their necrotic contents, treated, and filled, in order to protect them from the development of these neoplasms.

Treatment. In view of the etiology of these neoplasms adjacent roots should be extracted and the vitality of adjacent teeth be determined. If one or both adjacent teeth contain fillings they should be removed, and if the teeth are found devitalized they should be emptied of pulp-chamber and root-canal contents, and treated, but not permanently filled until the neoplasm has ceased to recur. If the adjacent teeth do not contain fillings they should be tapped, by drilling through the enamel, at a proper point, and the sensitiveness of the dentin tested; if found devitalized they should be dealt with as above stated, and if found to be normal the drill-holes should be filled with gold.

The local treatment of the non-pedunculated epulis—sarcoma or osteosarcoma—requires, as a rule, surgical operation, with the object of removing the involved portion of the alveolar process, encroaching as little as possible upon the subjacent body portion of the maxillary bone. This latter point especially applies to the inferior maxillary bone.

The operation is performed as follows: Adjacent teeth, where present,

are extracted, the involved alveolar process is included between two cuts of a suitable saw, and the processes are removed with a pair of gnawing forceps, or the alveolar process is included and removed with a chisel and hammer.

VALUE OF ACETATE OF ZINC.

My principal object in calling your attention to the subject of epulis is to bring to your attention the value, as judged from my experience, of the local application of the crystals of acetate of zinc in causing the arrest of the growth when it first appears, the prevention of recurrence after excision of the pedunculated variety, and even the arrest of the growth and prevention of its recurrence after superficial excision of the non-pedunculated variety.

Given a case where at an interproximal point a small bead-sized epulis presents, the daily application of the crystals will cause its disappearance; should it recur the daily application must be resumed as required, until it ceases to recur. The application is made by taking up a small piece of cotton in a pair of small forceps, dipping the cotton into the crystals, and applying them directly to the growth for a few minutes. After the application all crystals should be wiped from the adjacent mucous membrane before the mouth is closed. The patient can be instructed how to make the application.

Given a case of the pedunculated variety, fully developed, cut it off deeply with a pair of suitable scissors and immediately apply the crystals, which will stanch the bleeding. Thereafter the crystals should be applied once a day to the stump. The patient will experience a pricking sensation at the stump surface as they are applied, and during the

day there will be some irritation of the area; the surface is at first blanched by the application.

TREATMENT APPLIED TO A CASE OF SARCOMA.

I will here detail a case of special interest. In January 1899 a female patient presented with an epulis of a year's growth, about the size of a large pea, located at the interproximal space between the upper central incisors of a full upper denture of beautiful teeth. It was non-pedunculated, involving both surfaces of the gum, and it had separated the incisors a quarter of an inch. It was evidently a case of the sarcoma variety of epulis, originating from the alveolo-dental membrane. The question at once arose: Could the incisor teeth be saved by averting the necessity of an operation? The patient was told of the possible necessity of an operation which would involve the loss of the teeth, but at the same time she was told that were she willing to have it undertaken, an attempt might be made to save the teeth by arresting the further progress of the growth, and possibly effecting its ultimate disappearance; this, however, would take time and patience, and of course might not succeed.

The patient agreed to having the attempt made. The incisors were not filled and her dental surgeon was directed to tap them and test their vitality; the teeth were found normal, and the drill-holes were filled with gold. In January 1899 the neoplasm was cut away as deeply as possible; the acetate of zinc crystals were applied and the patient was instructed how to apply them once daily. The growth persistently recurred and for seven months it was excised once or twice each month. Then there was an

interval for two months (July to September 1899), when it was found to have recurred to some extent, and again for three months (September to December 1899) it was again excised once a month. The patient next called May 1900, when the growth was found to be about a quarter of its original size and there was an appreciable diminution of the space between the incisors. It was again excised repeatedly for two or three months, when the patient passed from my notice with directions to continue the application as required.

I had not seen the case since September 1900, but lately, desiring information for the purpose of this paper, I wrote asking as to the present condition of the case, and received the following answer,

of date March 1, 1903: "In regard to my wife's case I would say, for about a year after her last call (this was September 1900) she treated herself, and since that time it has given her no trouble, and has not appeared to grow at all."

Considering the nature of the neoplasm, and the original conditions, this is certainly a remarkable result. I would here state that although there were persistent recurrences of the growth, they were notably and progressively less active during the progress of the treatment.

Having thus presented my experience with the local application of the crystals of the acetate of zinc in the treatment of epulis, I hope its true value will be widely tested by both the dental and medical professions.

DISCUSSION.

The president called on Dr. Broomell to discuss the paper.

Dr. BROOMELL. I have nothing to say on the practical bearing of the paper. I will make a few remarks later regarding the histological and anatomical points referred to by the essayist. I would suggest that the practical bearings of the paper be discussed first.

Dr. C. W. STRANG, Bridgeport. I think perhaps most of you are familiar with some of the cases of tumor with which it has been my fortune to come in contact and to treat. Fortunately for myself I have had but one case where the results were fatal. I have had to do with quite a number of tumors of various kinds, and in all cases, with the exception of the one referred to, the results have been satisfactory, and a cure

effected. In some of these cases it has not been clear to my mind just what conditions were present. There occurs to me at present a case that came under my care, I think, about fifteen years ago, a young woman of, I should say, about thirty years of age, presented for examination with a tumor involving canine and lateral and central incisors on the right side—a growth that had been in progress about sixteen years, and protruded below the lip so far that it was almost impossible to close the lip over it. I examined the case, and after getting the history I concluded it advisable to remove it. The growth seemed to be anterior to the canine, and I decided it would not be necessary to remove this tooth. Before removing the tumor I took an impression of the mouth, and

after carving the tumor off the model I had a rubber plate made to fit the case nicely. When the plate was ready, I injected cocain freely in the tissues. That was in the early days of cocain, and I used it a little more freely than I care to use it now; however, there were no bad effects from the drug and the operation was painless. I cut down through the soft tissues with a lancet; when the soft tissues were divided, I went down into the bone-substance to the apex of the central and lateral incisors, and removed the bone and teeth in one piece. After the operation there was considerable hemorrhage, which was easily controlled, and the place was washed and packed with cotton saturated with phénol sodique. It was treated with phénol for a few days, and a healthy granulation appeared and in just six weeks the wound was perfectly healed. I never saw the case again, but it was in the hands of a brother practitioner who a few months ago had occasion to do some work in that mouth, and he informed me that there had never been any recurrence. I suppose that was a tumor of the epulitic nature that Dr. Weisse has spoken of.

Four years ago another case of the same nature came under my notice. This was a case in which the growth occurred between the upper central incisors. It had separated the incisors nearly the width of one of the centrals. The soft parts were removed; then, fearing that the bone might be involved, a generous portion of that was also removed, including the periosteum, and the wound healed with no serious delay. I saw the case about a year after the operation, and the centrals had approached each other and assumed their normal positions and the soft parts were perfectly healthy.

Dr. G. A. MAXFIELD, Holyoke, Mass. I want to express my appreciation of the paper, and to ask the doctor one or two questions. I do not recall at present a single case of tumor such as the essayist spoke of coming under my care. I have had three cases of tumors that proved fatal, two of which after microscopical examination were pronounced carcinoma; in the third case there was no microscopical examination made. Another case that came under my observation was a tumor that I clipped off by simply tying it with a string. I find that these cases do not occur very frequently, yet they occasionally occur, and it is well for us that we are able to recognize them and put their treatment in the proper hands. I recall one case in which, if the dentist had recognized the nature of the trouble and sent the patient to a surgeon for treatment, instead of attempting to treat it himself, even if failing of a permanent cure, the patient's life might have been preserved for several years.

On one of the casts now being passed around, the tumor is represented on the right side of the hard palate opposite the bicuspsids. I would like to know the treatment of such a case and how to differentiate it in diagnosis from that of an alveolar abscess. A case very similar to this came into my hands a few weeks ago. Another dentist had been treating the roots of the right central and lateral, and when the swelling appeared on the palate he told the patient she would have to go to Boston to have an operation for it. Then she was advised to consult me. After an examination and obtaining the history of the case, I told her I did not think it necessary to go to Boston for treatment. I opened into the tumor; there was a discharge of pus and it bled profusely.

I was not able to find a fistulous tract running to the lateral, though I felt sure the pus must have come from that tooth. I then made another incision just in front of the tumor and drilled through to the apex of the root; then washed it out thoroughly up through the canal and out through the incision on the palate; also washed out the tumor, using peroxid, followed with eucalyptol and aristol. I saw the patient two weeks later, when the tumor was almost gone. A week ago, when I filled the canal, the tumor had almost disappeared. Dr. Weisse alluded to his method of drilling into a tooth to determine whether the pulp is alive or not, and said that some may have another way of determining it. I agree with him that drilling into the tooth is the only way we can confirm our diagnosis.

In regard to using the zinc acetate, I would like to ask the doctor what remedy will control its action on the soft tissues if some should accidentally get on to other parts than where we wished to apply it. I remember speaking in a meeting once on the treatment of pyorrhea and advocating the use of triehloracetic acid. A friend wrote me afterward asking what I used to control it, as he had used it with rather disastrous results, so I think it well for us to know the professor's remedy for controlling the zinc acetate. I would also like to ask what is the treatment of the tumors that appear on both sides of the alveolus as illustrated by some of his casts.

Dr. F. T. MURRELLS, JR., Windsor Locks. When I was a student in the New York College of Dentistry I had a case of epulis under my care which Dr. Weisse treated. The epulis, which was quite large and had a distinct pedicle, projected buccally from the bifurcation

of the roots of the lower right first molar. The tumor was removed by the use of ligatures, the tooth extracted, and an application of chromic acid made to the wound. In the course of a month or six weeks the growth recurred as a pedunculated mass, and the patient returned for treatment. The growth was again ligated and the wound treated with chromic acid. Models were made in plaster at the different stages and preserved for reference. The history of the case is that during the eight additional years of the patient's life it did not recur after the second treatment.

Dr. GILBERT M. GRISWOLD, Hartford. I would like to inquire if epulis is always the result of some irritating substance like a pulpless root, the jagged edge of a cavity, a protruding band, or filling?

I had a patient about twenty years of age who had a growth which developed very rapidly. It seemed to start from a point in the alveolar process, between the upper right central and lateral incisors, a little below the apices of the roots, the whole growth being entirely above the gingival margin. The growth when first operated upon was of a smooth, purplish appearance about the size of the end of the little finger, extending below the incisors. The teeth were found to be perfectly normal in all respects.

Two of our most prominent surgeons were consulted with regard to the character of the growth, but without any satisfactory explanation. The growth was removed and all softened alveolar process thoroughly cut away, but it soon reappeared. It was again removed and treated and has not since appeared. After two years the parts are in normal condition, only a slight depression being left where the operation was performed.

Dr. I. N. BROOMELL, Philadelphia, Pa. Dr. Weisse has referred a question to me in regard to the presence of a periosteum on the outside lingual or buccal surfaces of the alveolus. Considering the fact that the maxillary bones are peculiarly developed we might incline to believe that there is some difference in their structure as compared to other bones. I speak with special reference to the mandible. The alveolar portion of the bone is only temporary in character so far as that it is absorbed when the teeth are lost, but it is permanent in character so long as it has a function to perform. That function is the support of the teeth; while this continues, the alveolar plates are just as permanent as any other portion of the bone. I think I may speak from experience gained by dissections, both microscopic and macroscopic. In the early development of these parts I find the primitive periosteal cells over the growing dental follicles as well as over the exposed surfaces of the bone. Of course this early period does not include the alveolar portion, but I am led to believe that as growth proceeds, as the walls are built up, this same layer of primitive cells will be found over the bone-surface. I believe also that a certain portion of the alveolus is the result of bone-cell activity in the alveolo-dental membrane. When we consider the physiologic absorption which necessarily takes place after the extraction of the teeth, I think we can argue for the presence of a periosteum on the outside of the bone. In showing the sections last night, you may recall that I said it was necessary in making them to cut entirely through the periosteum along the base of the bone. As the dissection proceeds there is no line of demarkation to show that the periosteum is limited. It goes not only to the mylo-

hyoid ridge which marks the extent of the true bone, but advances beyond this. As we approach the margin of the alveolus we find that the periosteum dips down into the sockets. The fibers of this tissue are associated with and enter into the construction of the dental ligament connected with the tooth at this point. These specialized fibers are present for the purpose of righting the tooth when forced or slightly rotated out of position by other than the usual masticatory forces. Speaking in regard to the general subject, I would like to ask Dr. Weisse if he has ever used the electric cautery in attempting to remove tumors such as were described in the paper. I have in a number of instances used this instrument in treating hypertrophied tissue, not where actual tumors existed but where the gum was engorged, and I find it particularly useful in treating hypertrophied gums over the third molar teeth where they are inflamed and irritated from mastication. One gentleman spoke of the use of chromic acid as applied to these cases of tumor. My understanding has always been that chromic acid is one of the best preservers of organic tissue known, and I do not see how it could be used to advantage in this connection.

Dr. WEISSE, New York. I am very much gratified at the discussion elicited by my paper on epulis. Dr. Strang's first case was very much like Liston's case that I showed on the screen, in which the tumor protruded between the lips. I am inclined to think that Dr. Strang's case was a fibroma, and doubtless would have assumed the proportions of Liston's case had it not been arrested by the radical operation performed by Dr. Strang, which brought about such satisfactory results. I do not remember

that the doctor stated how long it had been growing.

Dr. STRANG. The case, as well as I remember it, had been growing for about sixteen years, the last two years of which it had grown very rapidly; during the earlier years I would judge it had progressed very slowly.

Dr. WEISSE. Had it ever been removed?

Dr. STRANG. Never.

Dr. WEISSE. I have never had a fibromatous epulis with such a long period of growth. I have had them covering a period of ten years. With reference to Dr. Maxfield's remarks about the importance of diagnosing these cases so as to give them proper treatment, and not confusing them with carcinoma, I would say that the progress of carcinoma of the gum enables us to positively differentiate it from epulis. The epitheliomatous form of carcinoma, when it involves the gum, is a rapid grower—with a history of months, not years—invades more and more gum area, loosens and sheds the teeth, ulcerates early, and induces secondary involvement of submaxillary lymphatic glands, manifested by their perceptible enlargement and hardness. The instance that Dr. Maxfield gave, where an alveolar abscess was diagnosed as a tumor, is not without precedent.

Dr. Maxfield asked the question what agent I used to control excessive action of the zinc acetate on the surrounding mucous membrane of the mouth. From my experience none is needed, as it does not irritate the mucous membrane unduly. Dr. Maxfield also spoke of his use of the ligature for small tumors. I formerly used the ligature, but I found that it was a prolonged annoyance to the patient, and afforded only temporary relief, as the growth always recurred.

As to the presence of periosteum upon the free surfaces of the alveolar processes, I am very glad to hear Prof. Broomell's views. My deductions are from the life-history of the alveolar process, and from pathological conditions in which we see no attempt of nature to perpetuate or to reproduce the process when the alveolo-dental membrane has been destroyed. I have failed to find anything in our histological literature bearing on the question. I think it would be well for histologists to take up this subject and determine for us the presence or absence of periosteum on the free surfaces of the alveolar processes.

Dr. BROOMELL. Dr. Weisse speaks of the fact that we never have the re-forming of the alveolus after the extraction of teeth or in cases of pyorrhea. I think it is generally recognized that pyorrhea is not only a disease of the bone, but is also a disease of the surrounding parts. We have as a result of that disease the gradual disintegration of the periosteum, and for that reason could have no regeneration of bone tissue. With the loss of the teeth, that portion of the alveolus loses its functions, and there is no necessity for repair of the tissue at that portion.

Dr. WEISSE (closing the discussion). I appreciate and accept the points made by Professor Broomell in reference to the question of pyorrhea. I regard pyorrhea as primarily a necrosis of the alveolo-dental membrane progressing from the gingival margin into the alveolus, which secondarily determines necrosis of the osseous wall of the alveolus, thus depriving the tooth of its support. Here we have an instance of the primary importance of the alveolo-dental membrane to the life of the alveolar process, as compared with the inefficiency of the tissue

on the free surface of the alveolar process to perpetuate the process. Professor Broomell says: "After the loss of the teeth, that portion of the alveolus loses its function and there is no necessity for the repair of the tissue at that portion." Holding, as I do, that the alveolar process is developed and perpetuated by the alveolo-dental membrane, I would add that the extraction of the tooth destroys the alveolo-dental membrane, and therefore the process is subsequently absorbed.

The vessels of the gum tissue which remain upon the free surface of the alveolar process nourish the process sufficiently to prevent its necrosis, but are incapable of perpetuating the life of the process, as no periosteum exists upon the free face of the process, the gum tissue alone being attached to it.

Dr. E. A. BOGUE, New York city, then read a paper on "The First Permanent Molar: Its Uses and Abuses," as follows:

THE FIRST PERMANENT MOLAR: ITS USES AND ABUSES.

By E. A. BOGUE, D.D.S., M.D., New York City, N. Y.

SOMETHING like twenty years ago, I asked a prominent dental operator in New York as to his method of treating the first permanent molars. His reply was that he extracted every one he could lay his hands upon. I asked him why. He said that he always found those that came into his hands more or less decayed; that he regarded it doubtful whether he could preserve them through life, and that if he extracted all four of these teeth he was sure of that much less decay among the others which remained; further, that he thought there would be in almost all cases, were these teeth extracted at the proper period, a degree of separation that would insure greater cleanliness and consequently greater freedom from decay.

Last October I heard a gentleman who is prominent in the dental world, who has been connected with at least two dental colleges, and whose attainments in certain directions in his chosen field are rather unusual, expressing almost identical views, excepting that he limited his extractions to those cases in which he thought it necessary.

Now, if that be the view held generally in the dental profession it must be

because my brethren in practice have not carefully observed the conditions that lie before them from day to day. They have not taken impressions and made models of the teeth of those who present themselves as patients, young and old, big and little, especially the little folk. I have been forced into doing this for about twenty years, and I shall present for your observation some of the models from my collection, that you may judge whether the deductions that we are going to make together to-day are correct or not.

In the first place I shall present the model of a little boy, Master George D., about eight years of age. The first permanent molars, above and below, are developed so that they are in contact. The lower temporary molars are still in the mouth, while above they have fallen out, and the bicuspid is about half erupted. The cuspid is just peeping through the gum, and the upper incisors are lapped over the lower ones much farther down than they should be.

I hardly need say to this audience, that the first use of the first permanent molars is to sustain the jaws while the temporary teeth are being shed and the

other permanent teeth are being erupted. We hear so much better with our eyes, sometimes, than we do with our ears, that I take pleasure in showing you this model, taken just at this stage of development.

Another use to which these principal molars used to be put was mastication. The gentleman whose language I quoted a moment ago seems to have ignored this use, or he could not have extracted all the principal molars that he could lay his hands upon.

A third use is to sustain the features in the process of development, and later on in life, to give that nobility of expression which comes with strength, but which is lacking where these teeth are lacking.

A fourth use is to assist in sustaining the vault of the palate, without which there can be no clear and distinct enunciation—I mean just that, clear and distinct—and no high vocalization. I have elsewhere stated that Adelina Patti would never have been known for her wonderful vocal powers had her principal molars been extracted before the age of twelve years.

Another use which I have lately heard assigned to these four principal molars by one of my professional brethren, is, that they serve as good anchorages for regulating fixtures.

The sixth use is as singular as this last one, and fully as little known; in fact, I have never heard it announced. And that use is, to indicate at or about the sixth year of the child's life whether or not the molars and bicuspid are to be regular or irregular in their positions in the dental arches.

You have all read of Dr. Lorenz's operations upon the dislocated hip-joints of the little children brought to him for

operation during his visit in this country. I saw him operate twice, and was struck with the apparent ease with which he performed an operation that hitherto had *seemed* so difficult that we heard nothing of its being done on this side of the water except by those gentlemen who had formerly been Dr. Lorenz's students. I think you will agree with me, by and by, that the ease with which Dr. Lorenz replaced the head of the femur into its place in the acetabulum may almost be duplicated by the ease with which the dislocated first molars may be replaced into their proper positions, if the operation be performed at from six to eight years of age, instead of from sixteen to eighteen as has usually been the case hitherto.

In the first place, let me impress it upon your minds that these teeth of ours are formed upon a type suitable for the individual to which they belong. While I concede that there is no absolute regularity in anatomical conditions—that we might find an appendix upon the left side or a heart upon the right—yet we should naturally look for them in their proper anatomical positions; so should we look for correct sizes and positions of the teeth. If we find these four principal molars are developing out of their proper positions, either one of them being farther forward than the place it ought to occupy, we may be sure that in front of this dislocated molar there will not be enough room for the bicuspid and cuspid to be regularly placed, and we shall hence have irregular molars or bicuspid, or both, unless they are guided into right positions as they erupt.

Let me make myself clear. The normal position for the first permanent molars is that the lower one—which usually develops first—should be one

cuspid in advance of the upper one, which latter should come down astride of the posterior buccal cuspid of the lower molar. Any other position than that does not give the proper space for the remaining bicuspids and cuspids to develop.

You will notice at this point that I am leaving out of the question the anterior teeth, both above and below. It is true that upon the position of the cuspid teeth, and the lower incisors, which ought to arch from cuspid to cuspid regularly, depends the arch of the upper incisors. This has not especially to do with the first permanent molar, however, which is our subject at this time.

Now, if we include among the uses of these molars the use for reciprocal anchorages, assigned to them by one of my respected *confrères*, it will be seen that we have at once utilized the principal molar to regulate any irregularity that may be existing in this region. Now suppose that, instead of using this tooth to help draw all the irregular teeth into their proper relations with each other, we extract this tooth and undertake to make the cusps of the remaining teeth interlock with each other, we shall find that we have abused this principal molar in a way past forgiveness. We shall have abstracted the most essential part of the antero-posterior dental arch, the tooth that stands at the middle of the curve from before backward, the keystone of the arch, upon which depends all the cusping both in front of it and behind it. And while I can show you some of the most perfect specimens that I have ever seen, resulting from extractions, they—the patients—are all deficient in facial expression, in power of mastication, and in strength of arch, and the most perfect

cases among all those that I possess are those cases whose regularity least demanded extraction; where extraction was done simply to create spaces. The cases which I shall present to you that show the *worst* results are those which, being irregular to begin with, were supposed to require extraction in order to make room for regulating.

Another abuse of the first permanent molar is to neglect it. It must be remembered that the abuses for which extraction is so frequently practiced do not come (as a rule) except from dead pulps. The pulps do not die until they are exposed. It takes a big cavity to expose a pulp, and before the big cavity appeared there was always a little one.

It must be also particularly remembered that the enamel coating of the tooth, where it is perfect, is sufficient for its protection for life, provided ordinary cleanliness is observed; so if we correct by mechanical means, filling with an indestructible substance of some kind the little defects in the enamel, defects of form as well as continuity, we shall place these teeth in as good condition to last through life as any of the others, and if we inculcate the habit of thorough cleanliness the prospect is that there will be no need for the extraction of any of the first molars, or any other teeth.

This neglect also includes the failure to examine the teeth at a sufficiently early age, to know what their condition of regularity is.

After fully understanding thus much of the subject, I think the final abuse which to-day may be mentioned—namely, the neglect to replace these molars into their proper positions at the earliest possible moment—will cease.

DISCUSSION.

Dr. A. C. FONES, Bridgeport. I would like to ask the doctor, in the handling of these cases where the first molar is coming through in a wrong position, is there not some simple appliance that is especially adaptable for such work?

Dr. BOGUE. I do not want to enter upon a discussion of appliances, but I will try to answer this question. I think there is a simple appliance that is adapted to the correction of these cases. Last October Dr. Angle of St. Louis read a paper in New York describing his appliance, which I think is good for this work. Except for the scraping of the tissues on the inside of the rings and against the tongue, I think this appliance will do the work. I found that Dr. Angle had gone along the same lines as myself in this work, and the results in the main agree. What I told you about the early discovery of irregularity and the early treatment has not been published before anywhere.

Dr. JAMES McMANUS, Hartford. I want to thank Dr. Bogue, and I think those present will agree with me when I say this has been an exhibition of some of the most remarkable and beautiful cases of this kind we have ever seen. I think Dr. Bogue deserves much praise for the great amount of labor and the years he has spent in the collection of these cases, and I can only say that many who will come after us will have more abundant means and opportunities to study these questions than we older practitioners have had. I think this a good opportunity for every practitioner to take impressions of the cases and study them, and preserve them for comparison

with impressions taken later to show the results. I think this has been one of the most interesting exhibitions of this kind that I have seen, and I want to thank the doctor for myself and for the others. I make this as a motion.

The motion was carried.

Dr. McMANUS. I want also to thank the other gentlemen who have so kindly come here and given us exhibitions, and who have read us valuable papers. I make this as a motion also.

The motion was carried.

Dr. JOHN I. HART, New York. Your essayist has worked out this subject in a very instructive manner, but I think some of his conclusions are open to discussion. Dr. Bogue says that certain things should *never* be done, yet there are certain men, a little more conservative than he, who say that they *sometimes* should be done. It is unfortunately the case that some who have said that it should sometimes be done, after careful study and diagnosis, are quoted as saying that it should always be done. Nothing is farther from my mind than to assert that teeth should always or even frequently be extracted, but I assert that there are cases in which it is advisable. I was present at the meeting when the remarks were made that were quoted by Dr. Bogue, and I do not think that the gentleman intended to give the impression that Dr. Bogue implied. Dr. Bogue is too astute a man not to bring out all the points on his side of an argument, and I give him credit for presenting in a very creditable manner all these points, but we do sometimes meet with individuals who are shown by their family his-

tory to be prone to caries. Then Dr. Bogue's argument does not hold, and I contend that these teeth are benefited by judicious extraction—judicious with a capital J!

Dr. Bogue says that if Adelina Patti had had her permanent molars extracted before her twelfth year she would not have had the voice she has. He admits that there is a time when it can be done to better advantage than later. He admits that there is a time to extract them, and I say it is best to extract them before the second molars have come properly into the arch and have become properly cusped.

Dr. BOGUE (closing the discussion). It seems to me that there is something in the human heart—an acquired something—which seems like perversity; I do not know what else to call it. At the meeting to which Dr. Hart refers there was a paper read which elicited considerable discussion, but there was apparently a perverse disposition upon the part of all the gentlemen present, except two or three, to misunderstand what I said. I spoke of scientific facts without regard to cost, time, or class of patients. Dr. Hart says that the more conservative men take a different view from mine. I wish to make a correction there. I am the conservative fellow; those who do not conserve, extract. I have never said in my life, *Never* extract. When it is necessary, I *do* extract. I have extracted five teeth during the last twenty years—I mean good permanent teeth. Three were impacted third molars. One was an upper lateral incisor of a young lady thirty years of age who had been to four or five different men to have the tooth regulated, but none were successful. In that case I thought extraction was desirable, and so extracted the tooth. The

last was an upper third molar having no antagonist that prevented me from saving a second molar that was useful.

Now, what I have undertaken to show this morning is the manner in which, or the age at which the teeth develop, and their place when they have developed. I have attempted to persuade my brother professional associates to look upon this as I have been forced to look upon it, and to avoid the mistakes from which I have had to suffer. If they will look into it they will reach conclusions such as I have. I will say to Dr. Hart, that if he will make models and study them as I have done, he will learn some things that he did not know before.

One thing more: If we will look more carefully on the little children who come into our offices, and take impressions of their mouths and study them carefully, and study the conditions, we can tell why the teeth are going to become regular or irregular, and we will learn a great many things that we have heretofore known nothing about.

On motion the subject was passed, and the reports of the different committees were next taken up.

Dr. D. W. JOHNSTON, New Haven, remarked in regard to the place of meeting for the ensuing year, that he thought it for the best interests of the association that they meet in Hartford for the fortieth anniversary, and have a Hartford man for president.

Dr. STRANG. As chairman of the Committee on the President's Address, I beg to report that the committee has examined the address and considered the suggestions made therein, and express the wish that the president's address be published, and the recommendations

made in the address will receive attention at a later date.

On motion the report was accepted.

Dr. A. C. FONES then read the report of the Committee on Necrology as follows:

REPORT OF COMMITTEE ON NECROLOGY.

The Committee on Necrology beg to report that during the past year but one death has occurred in our membership, that of Dr. George H. Waters of Waterbury.

Born nearly eighty years ago, in 1824, at Thompson, Conn., George H. Waters received his early education in the common schools at Thompson, and also at the Dudley Academy of Dudley, Mass. In 1849 he took up the study of dentistry under the worthy preceptorship of Dr. Joseph H. Beals of Greenfield, Mass. He came to Waterbury in 1852 and remained there in active practice up to the time of his death, which occurred February 1903. During his earlier life he was active and prominent in athletics. For forty-eight years he was a prominent Odd Fellow, and published in 1898 some historical notes concerning Nosa-hogan Lodge, No. 21, of Waterbury.

Being one of the original members of this association in 1864, he can well be classed with that faithful body of men who have laid such a good foundation for our profession in this state. A skilful and conscientious workman, he gained the respect and esteem of the community. We may remember him as one whose life was well spent and a man whom our profession may well honor.

A. C. FONES,
HOWARD G. PROVOST,
GEORGE S. KENDALL,
Committee.

On motion the report was accepted.

Dr. JAS. McMANUS, as a report of the Committee on By-laws, offered the suggestion that a special committee be appointed to be called the "Program Committee," whose duty it will be to arrange for the papers for the annual meeting. This was made as a suggestion, rather

than an amendment to the by-laws to be acted on at the present session; it was for the consideration of the incoming president and to be acted upon at the next annual meeting. Dr. McManus suggested that the president and vice-president, and the members of the Executive Committee be *ex officio* members of that committee.

Dr. GAYLORD, chairman of the Nominating Committee, made the following report:

REPORT OF NOMINATING COMMITTEE.

To the Connecticut Dental Association:

Your committee take very great pleasure in presenting the following ticket for your consideration and election as officers for the ensuing year:

For President—Dr. Geo. O. McLean, Hartford.

For Vice-President—Dr. David W. Johnston, New Haven.

For Secretary—Dr. Frederick Hindsley, Bridgeport.

For Treasurer—Dr. E. B. Griffith, Bridgeport.

For Assistant Secretary—Dr. C. C. Prentiss, Hartford.

Executive Committee: Dr. Henry McManus, chairman, Hartford; Dr. W. H. Metcalf, New Haven; Dr. C. F. Gibbs, Bridgeport.

For Librarian—Dr. R. H. Keeler, New Haven.

For Editor—Dr. A. H. Spicer, Westerly, R. I.

E. S. GAYLORD,
C. F. GIBBS,
CHAS. O. CROSBY,
Committee.

As an amendment to the Nominating Committee's report, Dr. A. H. Spicer, Westerly, R. I., was nominated for editor, and Dr. R. H. Keeler, New London, for librarian.

The report of the Nominating Committee, with the amendment, was accepted, and by unanimous consent the

secretary was instructed to cast one ballot for the entire list of nominations. The president announced them all elected.

Dr. JAMES McMANUS. As you all know, the society has grown considerably in the past few years, and the duties of secretary and treasurer have become arduous. I move that as a mark of appreciation of the services of secretary and treasurer fifty dollars in gold be presented to each from the society.

The motion was carried.

The secretary then read the following applications for membership: Dr. Walter E. Gerrish, Naugatuck; Dr. Christian C. Schneider, Waterbury.

On motion the secretary was instructed to cast one ballot and both applicants were declared elected.

On motion of Dr. HENRY McMANUS each member of the State Association was elected a delegate to the National

Association, with instructions to the secretary to issue credentials to those who intend going to the annual meeting.

The new president, Dr. George O. McLean of Hartford, was conducted to the chair, and Dr. Eberle presented him with the gavel, and congratulated him on being elected the president of the Connecticut State Dental Association.

On motion of Dr. JAMES McMANUS, a vote of thanks was offered to the officers for their services during the past year.

On motion of Dr. HENRY McMANUS, a vote of thanks was given to the clinicians and essayists of the meeting.

On motion of Dr. GRIFFITH, a vote of thanks was given to the DENTAL COSMOS for reporting the meeting.

On motion of Dr. PRENTISS, a vote of thanks was given to the local press.

Motion was then made and carried to adjourn until the next year.

TRANSACTIONS

OF THE

Connecticut

State Dental Association

AT ITS

Fortieth Annual Convention

HELD AT

HARTFORD, CONN.

April 19 and 20, 1904.

PHILADELPHIA:

THE S. S. WHITE DENTAL MANUFACTURING CO.

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TRANSACTIONS

OF THE

Connecticut State Dental Association,

AT ITS

FORTIETH ANNUAL CONVENTION,

HELD AT

Hartford, Conn., April 19 and 20, 1904.

TUESDAY—Morning Session.

THE fortieth annual meeting of the Connecticut State Dental Association convened in Unity Hall, Hartford, Conn., April 19 and 20, 1904.

The first session was called to order on Tuesday, April 19, at 10 A.M. by the president, Dr. GEORGE O. McLEAN, of Hartford.

The regular custom of having an annual address from the president was substituted by the reading of an historical sketch of the society by Dr. JAMES McMANUS, Hartford. (For this paper see page 2.)

Dr. C. C. PRENTISS, assistant secretary, read the minutes of the last meeting, which on motion were accepted and placed on file.

Dr. E. B. GRIFFITH, Bridgeport, treasurer, read the following report for the year 1903:

TREASURER'S REPORT.

BRIDGEPORT, CONN., April 18, 1904.

The Treasurer of the Connecticut State Dental Association offers the following report for the past year:

RECEIPTS.

Balance on hand April 20, 1903.....	\$521.63
Received from Dr. G. O. McLean, Chairman Exhibit Committee.....	277.00
Received from Dr. F. Hindsley, secretary, for new members.....	85.00
Checks returned Dr. C. M. Gingrich..	14.50
“ “ Dr. B. Holly Smith..	15.35
“ “ Dr. A. C. Brewer....	16.50
Interest an acct to April 1, 1904....	10.22
Received from dues during the year...	242.00

\$1,182.20

Disbursements as per vouchers.....	636.67
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Balance as per bank book.....	<u>\$545.53</u>
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Respectfully submitted,

EDWARD B. GRIFFITH, *Treasurer.*

On motion the treasurer's report was accepted as read.

AN HISTORICAL SKETCH.

By JAMES McMANUS, D.D.S., Hartford.

THE historian can readily point to the names of men who practiced dentistry previous to 1800 who were medically educated and were skilful operators and artistic mechanics. Among the number were a few who for their day, and also judging by the standard of today, were men of rare scholarly attainments as writers and translators; and the work they did and the published records they have left to us place them as peers among professional men.

These early exceptions—men with liberal education and holding the medical degree—did not and could not gain for dentistry in this country recognition other than as a trade, or to its workers a status above that of the mechanic. It was recognized early in 1800 by Dr. Horace H. Hayden, a native of Connecticut practicing at that time in Baltimore, Md., that dentists, if they wished to gain knowledge, experience, and increased skill, must band together in associated effort and strive to break down the barriers that surrounded the men and offices where selfish and secret methods prevailed; and after years of persistent work he was successful in calling together enough men to organize a dental society in New York city, August 18, 1840.

The same Dr. Hayden and the men associated with him in that society had long before tried to interest and influence medical men to add a dental department in the medical schools; but their request was denied, and as a result the Baltimore Dental College was organized, and held its first session in 1840. The organization of the American Society of Dental Surgeons, with Dr. Horace H. Hayden as president, and another Connecticut man, Dr. Solyman Brown, as recording secretary, and the establishment of the Baltimore Dental College with Dr. Hayden as president and professor of the principles of dental science—both events occurring in the year 1840—mark the birth of dentistry as a profession in this country. The experience of the American Society of Dental Surgeons was a stormy one for a few years, and it was then dissolved. The success of the Baltimore Dental College was followed by the incorporation in Cincinnati of the Ohio Dental College in 1845, and of the Pennsylvania Dental College in 1856. The American Dental Convention was called in 1855, and the American Dental Association was organized in 1859. This association started out with twenty-five members, sent as delegates from eight societies

and two dental colleges. The principal official act of this association was the promulgation of a code of dental ethics in Boston in 1866.

Thus far, in brief, is a partial record of the dental profession up to 1860. There were a few men holding the medical degree in New England who had taken up dentistry, and there were also a few possessing an education higher than that given in the public schools, who had spent from a few weeks to a few months in the office of practicing dentists who had gained their own knowledge from a no higher source. The larger number were men of limited education, whose sole claim as dentists was their mechanical ability—and pretensions. Connecticut no doubt had her proportion of good dentists, for we find that as early as 1838 Horace Wells, surgeon-dentist, Hartford, published a little book of seventy pages entitled "Essay on Teeth," and later, December 11, 1844, he voluntarily inhaled nitrous oxid and submitted under its influence to a surgical operation; thus he discovered, demonstrated, and proclaimed the blessings of anesthesia. Hiram Preston, surgical and mechanical dentist, Hartford, Conn., in 1848 published a book of 104 pages entitled "Hints for the Multitude Relative to the Teeth." As far as I can learn, these two were the only dentists practicing for years in this state who had given out to the public in book form any information or instruction regarding the care of the teeth.

We find also that the Baltimore Dental College conferred the honorary degree on four dentists credited to Connecticut. Only two of the number had lived and practiced for many years, until their death, in this state—Asa Hill, D.D.S., Norwalk, 1847, and E. E. Cro-

foot, D.D.S., Hartford, 1853—and there were regularly graduated from that college Henry J. Stevens, D.D.S., 1852, and Charles O. Hall, D.D.S., East Hartford, 1860. There had been a few men with a medical degree who had spent a little while practicing dentistry in different parts of the state, but the names I have given you were the only Connecticut men holding a dental degree up to 1861.

The first gathering of dentists that I attended was the annual meeting of the American Dental Convention held in Music Hall, New Haven, August 6, 1861. This was a popular convention admitting to membership anyone claiming to be a dentist on payment of the annual fee. The sessions were very interesting, especially the discussions on "Etiquette" and "The Fraternal Relations and Courtesies Among Dentists and Physicians." Professor Hooker invited the members to visit the Yale Medical School, and also addressed the convention and took part in the discussions. The faculty of Yale appeared to be more interested in dental affairs then than at any time since. I met there and listened to a number of the prominent dentists of the country, but was very much disappointed in not seeing more of the Connecticut dentists, as only nineteen were present.

The Connecticut Valley Dental Society was organized in Springfield, November 10, 1863, and there was only one Connecticut man at that meeting, Dr. Chester Johnson of Enfield. The third meeting of the Connecticut Valley Dental Society was in Hartford, May 6, 1864. It was called there to meet Dr. Jonathan Taft of Cincinnati, Ohio, who was making a tour of the Eastern cities as the representative of the American Dental Association to arouse an interest

in the formation of local dental societies. He was accompanied by Dr. Wm. H. Atkinson, then of New York city. The meeting was a very interesting one, but only five Hartford dentists took interest enough in its success to become members. At this meeting I was appointed a delegate to the meeting of the American Dental Association, which was to be held at Niagara Falls in July.

The meeting of the American Dental Convention at New Haven in 1861, and of the Connecticut Valley Dental Society at Hartford early in 1864, failed to awaken any interest as to the need of a dental society in Connecticut. The long-time habit of secrecy and exclusiveness maintained by many of the older dentists rendered them apparently unable to see or to appreciate the magnitude of what was being done for dentistry in the middle, western, and southern states.

The Niagara Falls gathering was a revelation. The character and well-known ability of the members, the kindly, helpful spirit manifested at the meetings, and the cordial good-comradeship shown at all times, filled me with a desire to obtain for Connecticut a right to send delegates to that association. Soon after my return from that meeting I consulted with a young dentist, Dr. Leroy D. Peltom, and we appointed ourselves a committee and sent out a circular invitation to the dentists of the state to meet in Hartford, October 20, 1864, to assist in organizing a state association.

A part of the circular read thus: "You understand the objects sought by an organization of this kind: the advancement of its members in professional knowledge, and the better establishment of fraternal love and good-fellowship. That there are individual and public

benefits to be derived from a free interchange of professional opinions and experiences must be obvious to every thinking man, and presuming that you are a thinking man we call your attention to the subject and ask your hearty co-operation."

We were more than pleased with the response to our circular. As thirty-nine dentists responded, a temporary organization was effected by the election of Dr. E. E. Crofoot as president, and Dr. J. McManus as secretary. A committee was appointed to draft the constitution and by-laws, which were adopted at the afternoon session, and the following named gentlemen were elected: Dr. Asa Hill, Norwalk, president; Dr. W. W. Sheffield, New London, vice-president; Dr. James McManus, Hartford, recording secretary; Dr. Leroy D. Peltom, Hartford, corresponding secretary; Dr. E. E. Crofoot, Hartford, treasurer; Dr. Charles P. Graham, Middletown, librarian. Executive Committee—Drs. Samuel Mallett, John T. Metcalf, and H. J. Stevens, all of New Haven.

At the meeting for organization the subject of the Boston Hard Rubber Company claim for tribute was discussed, and the following resolution was adopted: "*Resolved*, That the members of this association hold themselves in readiness to contribute the sum of ten dollars each to the Boston Protective Union for the purpose of defense against prosecution for using hard-rubber base whenever in the judgment of the executive committee it shall be deemed expedient." In the evening a reception was given to the members by Mr. James H. Ashmead, of the firm of Ashmead & Hurlburt, gold foil manufacturers, at his residence on Wethersfield avenue.

At the May meeting in 1865, in his

address, the first presiding officer presented some practical suggestions, a few quotations from which may interest you all, and also recall to the few older members the genial presence of that eminently good man and dentist, Dr. Asa Hill of Norwalk: "As individual members of an honorable profession, it is fair to presume that we have accorded to us by the community in which we live our appropriate status, and that we each of us wield the influence to which we are justly entitled. . . . But what shall be the character of our association, and what can we do for each other and the public around us? . . . I trust that a mere ephemeral existence will not satisfy the purpose and designs of those who are present today. . . . To save us from disintegration and dissolution there must be a common interest, and that interest must be perpetual. We shall find that interest in our mutual improvement if we do not withhold our individual contributions to the common stock. Now, there may be individuals who could get along very well without the aid of such associations, but I shall do no injustice to such if I should say that no one man knows everything, and he must be a very dull scholar who cannot learn some valuable lesson from an inferior mind. . . . Another great object we should ever have in view at our meetings should be the public good; we best serve ourselves when we are serving others well. . . . This thought should ever save us from mean and petty jealousies. . . . Scientific pursuits are always ennobling, and dental science is kindred to medical science, and medical science intermeddles with all knowledge."

Dr. Hill also spoke of the advisability of the Yale Medical School adding a

dental department, and later, in May 1866, he sent a communication to the president and faculty asking for its establishment. The State Association at the annual meeting appointed a committee to visit the Connecticut Medical Society and present the matter to them. The members listened with surprised interest, and the subject was dropped. The Yale managers then lost their opportunity, for Harvard College the next year established a dental department.

At this meeting a paper was read by Dr. Isaac Woolworth of New Haven on the "Past, Present, and Future of Dentistry," one by Dr. Samuel Mallett of New Haven on "Patience in Dentistry," one on "Means of Controlling the Flow of Saliva," by Dr. W. W. Sheffield of New London; and one by Dr. John T. Metcalf of New Haven on "Filling Approximal Cavities." Dr. Wm. H. Atkinson of New York by request gave his views on the use of the mallet and wedge in filling approximal cavities, and on the treatment of teeth with an open abscess. President Hill gave the proper method of using the preparation known as "Hill's stopping."

The semi-annual meeting was held in New London, October 3, 1865, and the following visiting dentists were elected as honorary members: J. H. McQuillen, M.D., D.D.S., Philadelphia Dental College; Dr. I. J. Wetherbee, Boston, Mass.; L. D. Shepard, Salem, Mass.; F. Searle, Springfield, Mass.; Wm. B. Hurd, Williamsburg, N. Y.; and J. Chesebrough, Toledo, Ohio. Papers were read as follows: By Dr. Isaac Woolworth, on "What Causes Teeth to Decay"; by James McManus, on "Filling Approximal Cavities"; by L. D. Shepard, on "Professional Education."

The subject of irregularities and the

study of models presented by Drs. Crofoot and Sage was taken up, and detailed methods of procedure were given by Drs. Shepard, Wetherbee, Crofoot, Woolworth, Sheffield, Sage, Atkinson, and McQuillen. At the evening session an opportunity was given the members to examine specimens of bone and teeth under the microscopes brought by Professor McQuillen and Dr. Atkinson, and all had a good chance to study the specimens and get clear and correct ideas of the structure of the teeth. To the majority this was a novel and interesting meeting. Professor McQuillen gave a lecture on the "Microscopy of the Dental Tissues," illustrating with large drawings, and the subject was discussed by Dr. Atkinson. A paper was read by Dr. Shepard, "Are You a Reading Man?" It was a strong plea for the support of dental journals. He made one statement that was a surprise to many. He said that "Only one dentist in five in our boasted New England was a subscriber to a professional magazine." You may judge from that statement of the professional, literary, and studious habits of the majority of the dentists previous to 1864.

The Transactions for 1864 and 1865, which were published in book form, contained the address of the president, Dr. Asa Hill, and the papers by Dr. Isaac Woolworth, Samuel Mallett, John T. Metcalf of New Haven, W. W. Sheffield of New London, L. D. Shepard of Salem, Mass., James McManus of Hartford, Wm. H. Atkinson of New York city, and Prof. J. H. McQuillen of the Philadelphia Dental College; with the discussions, records, and names of the officers and members.

The Hartford Society of Dentists was organized in 1865, and in 1870, with the

co-operation of the State Association and the Connecticut Medical Society, a movement was made that resulted in placing a statue of Dr. Horace Wells, the discoverer of anesthesia, in Bushnell Park, July 22, 1874. An unfortunate change, increasing the initiation and membership fees, caused a falling away in the membership of the society and a lack of interest in the meetings for a few years. Another interesting event was the celebration of the fiftieth anniversary, and the unveiling of a tablet on the building on Main street which marks the spot where Dr. Wells made his discovery. It was a notable historical event. Among the guests at the banquet was Dr. Colton of New York, who was one of the famous trio and the one who furnished the nitrous oxid, also Drs. Gurdon W. Russell and P. W. Ellsworth, the Hon. Henry Barnard, and by letter the Hon. Alfred E. Burr, all over eighty years old and all personally acquainted with Dr. Wells when he made his discovery. The tablet was a memorial gift to the city from over 270 dentists, nearly two-thirds of the contributions coming from outside of Connecticut, and representing twenty-nine states of the Union. Mayor Brainard, in his response in accepting the tablet, assured the members of the State Association of the approval of his action by the city council and the citizens of Hartford.

I have given you detailed accounts of these early meetings and events so that the younger members might have an idea of the character and influence of the association in its earlier years, for it is hardly possible for them to realize the difficulties that had to be surmounted by all who desired to become dentists previous to the organization of this and

kindred associations. Frequently pictures of interesting scenery are shown with the remark that they do not give a good idea of the beauty; that the place should be seen. So with all statements descriptive of the methods and manner of dentists toward each other forty years ago; those only know who were in practice then, and they only can appreciate the great change brought about through the work and influence of associations.

In 1864 there were four dental colleges; now there are fifty-two, with dental societies in every state and many of the cities. There were only two dental journals then; now there are about twenty. The text-books then were few, now they are many, and the literature of the profession as a specialty is equal, if not superior, to any of the departments of science and medicine.

The population of Hartford in 1864 was 32,000, and the number of dentists was fourteen. The population today is 87,836, and the number of dentists is seventy-five.

The population of the state in 1864 was 491,000, with 135 dentists; the population today is 973,000, and the number of dentists registered and licensed is 500.

Of the thirty-eight dentists present at the organization of this association forty

years ago, there are living today only eight; two of these withdrew from membership many years ago, three have lived out of the state for many years; only three members are left to recall the first meeting and the earnest men that responded to the call of the promoters, whose sole aim then was to band dentists together for the advancement of professional knowledge, manipulative skill, and the cultivation of good-fellowship. They know, and all that have since held membership know, that the association has always advocated and striven for a high standard of educational, professional, and ethical methods.

Over fifty years ago it was said by Dr. Horace H. Hayden that "We assume the title and claim the rights and privileges of being the studious, diligent, and successful cultivators of at least a branch of that important, noble, and only divinely sanctioned science that was ever cultivated by man—the science of medicine." Surely today the members of this association can indorse the sentiments expressed by the father of American dentistry. It has for forty years done earnest work along the line indicated, and up to the standard set by him, and we can justly feel proud of the success and professional record of our State Association.

Dr. E. W. PRATT moved that the historical sketch as presented by Dr. McManus be received as read by him and placed on the records of the Connecticut State Dental Association, and that the thanks of the society be expressed to Dr. McManus for preparing and delivering the same.

The motion was carried unanimously.

Dr. A. C. FONES, chairman of the Committee on Necrology, reported that up to a few days before the meeting the committee had no report, as none of the members had died since the last meeting. The day before the meeting, however, Dr.

Geo. C. Eighme of Bridgeport died from injuries received in an automobile accident which had occurred a few days previous. The committee had not had time to formulate appropriate resolutions.

On motion of Dr. HENRY McMANUS, the above report was received, and the Committee on Necrology was instructed to draft appropriate resolutions on the death of Dr. Eighme.

Dr. RIGGS, chairman of the Clinics Committee, reported that the clinics would be held on Wednesday afternoon, in the balcony of the hall.

Nomination of officers was the next business before the society.

Dr. McMANUS moved that a committee be appointed by the president to present nominations for officers of the society for the ensuing year.

The motion was carried.

The President then announced as the Nominating Committee the three pre-

ceding presidents of the Association, Drs. Henry McManus, Hartford; A. C. Fones, Bridgeport, and Edward Eberle, Hartford.

Under the head of new business the following applications for membership were presented: Geo. G. Herr, Waterbury; J. L. Egan, Bridgeport; F. T. Murless, Windsor Locks; G. A. Comeau, Norwich; J. J. McDonald, Waterbury; H. E. Snow, Hartford; A. LeB. Stebbins, Colchester; R. W. Van Wagner, Waterbury; A. C. Thompson, Torrington; E. G. Cunningham, New Canaan; J. H. Kane, Hartford; H. E. McGuire, New Haven; Edwin Whitford, Westerly, R. I.

On motion of Dr. E. S. GAYLORD, the secretary was instructed to cast one ballot for the entire list of applications, and the above gentlemen were duly declared members of the Connecticut State Dental Association.

There being no other business on hand, the motion was made and carried that the meeting adjourn until 2 o'clock P.M.

TUESDAY—Afternoon Session.

THE afternoon session was called to order at 2 o'clock by the President.

Dr. JAS. McMANUS moved that the president of the association be instructed to send a telegram to Dr. Hindsley, Bridgeport, secretary of the society, expressing the sympathies of the society in the loss of his wife.

The motion was then carried unanimously.

The next order of business was the reading of a paper by Dr. C. H. GERRISH, Exeter, N. H., on "Why I Use Non-cohesive Gold Foil for Stopping Teeth," as follows:

WHY I USE NON-COHESIVE GOLD FOIL FOR STOPPING TEETH.

By C. H. GERRISH, D.D.S., Exeter, N. H.

MR. PRESIDENT, AND GENTLEMEN OF THE CONNECTICUT STATE DENTAL ASSOCIATION: It is a pleasure and an honor to be here today; a pleasure because I feel that you are my friends; an honor because I feel that I am in the company of those who are my superiors—and yet I feel that I am a thoroughbred. I am to present to you today a talk on a material which is old-fashioned, the use of which does not obtain much at the present day, but which without doubt will be used more by the coming generation. You as a society are celebrating your fortieth anniversary. I am celebrating my fortieth anniversary of practice in dentistry. I began when non-cohesive gold was practically the only material to be obtained, and when the work was all done by hand, and I have followed this line of work for the simple reason—I don't know whether it obtains now or not—that I can save teeth with it. That is one of the few reasons why I use it still.

The practice of dentistry today is on machine lines, but the lines I work on are those of hand-work, and the results of this work I hope to prove are very acceptable. I have used this material under all conditions. Since I first began, many

materials have been brought out from time to time as being valuable for the preservation of the teeth and the salvation of the dentist; they have been tried and found wanting. I come to you with the oldest material used for the preservation of teeth, and when I say that for forty years I have used the same, and had few failures with it, I feel that I know something about non-cohesive gold if I know nothing about anything else. I will not attempt to give you a scientific talk, but a practical one, and directed especially to the young man, who has a future; the older men's habits are set, and I do not try to change them; it would be useless if I did. So my talk is especially to the younger men of the profession.

After forty years of use of this material I work along the lines of stopping teeth rather than filling them. Anything may fill a cavity, but there are very few materials that will make a perfect stopping. This material will do as good work, and makes a perfect stopping for the present and for the future. Now, a perfect stopping is one that will prevent leakage from either within or without. We stop a bottle to keep the contents

from leaking out, and we stop a tooth to keep anything from leaking in. A perfect stopping must be softer than the thing stopped, and a perfect stopping is something absolute; if not absolute it is not perfect. For instance, a rubber tire may be perfect in every respect except that at one place there may be a little puncture, but that one little hole will let the air out, so the tire is not perfect. You may as well have a dozen holes, so far as keeping the air in the tire is concerned. A pair of rubber boots with one little hole lets the water in and fails to serve the purpose; in fact, you had better have a half-dozen holes, then the water will be able to get out, but with one hole it lets the water in and it cannot get out. I have here a bottle of alcohol with a ground-glass stopper; when I put in the stopper and turn it, I can turn to a certain point and no farther. The bottle is stopped, or not; now, you must admit that it cannot be made tighter if it be not stopped at this point.

Here is a bottle containing alcohol, for which I have a cork stopper. I put in this stopper and turn until I know it is tight. If it be not tight I can turn until it is tight, and can always make it tighter; and it is easy to see that this reserve in the cork stopper makes it better for stopping the bottle than the ground-glass stopper which has no reserve. Now, it is this reserve in non-cohesive gold filling which makes it serviceable in saving teeth.

What is non-cohesive gold? It is a foil made into leaves which when pressed together will not stick; they will lie close together, making a solid soft mass. Now, soft is a term which is applied to both cohesive and non-cohesive gold, and it is this quality which makes it advantageous in our work. The softer the gold

is, the more adaptable it is to the cavity. The principle of working non-cohesive gold is the wedging principle. The principle of working cohesive gold is the welding—the sheets lie on each other; but the principle of working non-cohesive is that each pellet stands upright, so that when the filling is finished the surface presents edges rather than flat surfaces. The same condition applies at the base of the cavity.

When there is a defect in this filling material you can continue to force in these pellets until you know that it is absolutely tight, but in the case of the cohesive gold, where the sheets are welded to each other, the little defects are covered up and there is no way of remedying them. The point is that the first piece must not move from its place, and when you put in two, three, or four pieces, they must be parallel to the walls of the cavity so that the last piece makes the keystone of the arch. Now, that filling cannot be moved out of the tooth unless you pull out one of the cones, any more than you can destroy the arch of a bridge unless you pull out one of the stones. If you take one stone out the arch will drop, and this is the structure of the non-cohesive gold filling. Cohesive gold is worked the other way; one piece is put in and the next piece is welded to it, and so on until the last layer covers the entire filling, and the layers are perpendicular to the walls of the cavity from the bottom up. When you get to this point, if your filling be not perfect it can never be made so, but in the case of the non-cohesive, the layers being parallel to the walls, if the filling be not perfect you can by the wedging process make the filling absolutely tight, and you have presenting the edges of the gold, on which the action of the burnisher produces a

perfect adaptation. I know that cohesive gold is necessary in a great deal of our work. It is impossible to work without it. It appeals to a great many operators for this reason: it works itself. That is to say, there is no great amount of skill necessary to keep the pellets in position; after you get one to stay, you can continue. When most young operators fail to make a success with cohesive gold, they order gold that is more cohesive.

Now take the two fillings when finished. With the cohesive gold, the filling is hard; the more cohesive the gold the harder is the filling. When you get the non-cohesive filling in, it is soft. One filling is practically a gold plate, and the other is gold foil. You can take the cohesive gold filling out of the tooth and it is practically a gold ingot; but take the non-cohesive filling out, and it can be picked to pieces. You have not destroyed the qualities of the gold. It is a foil filling when finished. It is like the cork stopper in the bottle; the harder it is pressed upon, the tighter it will get. There is one place in filling a tooth that must be made tight, and that is at the marginal walls. If it be imperfect at that point, your filling is no good; there is a leakage, an opportunity for the bacteria to get in and do their work. With the non-cohesive foil, that is the one locality that you can be absolutely sure of having perfectly tight, and if that one place be tight it does not matter so much about the inside of the cavity; it will keep the bacteria out.

Dr. Miller says that non-cohesive gold has certain germicidal properties; that teeth filled with this material are not so readily attacked by bacteria. And for this reason I claim that it will save teeth longer, and save teeth of a lower grade

of structure than will cohesive. It has been my experience in filling children's teeth that I can save them better with this material than with any other. The theory today, however, is that children's teeth will not warrant the use of gold. Gutta-percha or cement is generally used until the children reach the age where the structure of the teeth will warrant the use of gold. From this practice you simply have a waste of tooth-structure; the teeth continue to decay until, when the time comes to fill with gold, you have an unwarranted display of gold in the mouth.

Another advantage of this material is that you can combine it with cohesive gold. I have made tests within a short time as to the strength of the two when combined. As an extreme test, I have taken a cavity on the grinding surface of a molar and filled it with non-cohesive gold; then I have worked cohesive gold on this, and in testing the attachment of the two I have never been able to separate them. I have been able to pull the soft gold filling out, but a separation between the two I have never been able to obtain.

With regard to its early history: When we consider that non-cohesive gold was used without any modern appliances for keeping the cavity dry, with no dental engines, and none of the conveniences we have today, it is remarkable the results that were obtained. Many times in filling a tooth the filling would become wet two or three times. We would frequently take out the napkin and rest for a few minutes, then dry out the cavity and go on as before. Dr. Shepard at the last meeting of the Harvard Odontological Society showed a tooth which Dr. Howard filled sixty years ago. The tooth was broken, and there seemed to

be a kind of amalgamation of the gold and the tooth. The filling had to be scraped from the surface of the tooth, showing a most perfect adaptation to the cavity walls. I have noticed in my own work where I extracted teeth filled with non-cohesive gold, that after breaking them open there seemed to be a kind of amalgamation between the gold and the tooth-structure—showing the adaptability between the tooth-structure and the gold to be absolutely perfect.

One grand test of a perfect filling: A perfect filling is one that you can finish up. Did you ever think of that? Take a poor filling, and the longer the operator works, the worse it looks. If a man makes a poor filling the thing to do is to let it alone. Another test of the two materials is that a poor non-cohesive filling is better than a poor cohesive filling. Take two men who do not know how to fill teeth with any material, and the man who puts in non-cohesive gold will save more teeth than the man who uses cohesive gold. That shows the merit of the material.

Last summer I had one of my patients in my office, and in looking over her mouth I found fillings that had been there fifteen, twenty, and twenty-five years looking as beautiful as when the work was first done. Last month one of my patients died for whom I had worked thirty-eight years, and she had never lost a tooth, and practically never lost a filling. Gentlemen, I am not egotistic in citing these cases; I am simply zealous in my advocacy of this material. To be sure I had good teeth to start with, but relatively one has the same results in poorer teeth. Difference in the teeth makes a difference in the durability of the work. To give you an idea of the percentage of work that I

do, I was looking over my book for the year 1874, and found that during that year I put in six bone fillings, 50 tin, 53 gutta-percha, 118 amalgam, and 671 gold; that made a percentage of seventy-five per cent., which I think is a pretty high percentage of gold work.

Some beautiful workers in cohesive gold get excellent results—save teeth for almost as long as they could with non-cohesive gold. The principal merit of cohesive, however, is in cases where there is practically no tooth to save. The larger the cavity and the more broken down, the nearer the cervical margin under the gum, the longer the cohesive work seems to last. We have in our state many beautiful cohesive-gold operators. I have seen their patients and viewed the results with admiration, but these men are artists, and they know the weakness of the material. In using cohesive gold, if the operator condenses the gold before he gets it to the walls of the cavity, he makes a mistake. An expert in this work does not condense his gold until he gets it to the place where he wants condensation. In the case of non-cohesive gold, if you happen to get the gold in the wrong place you can move it, and have not destroyed the quality of the gold; but in the use of cohesive, if any pressure is brought to bear before you get it to the place you want it, the filling is of no value.

Dr. Ottolengui, in discussing a paper of mine before the Maine State Society, at Kineo, said, "Why is it, if Dr. Gerish's method of filling teeth is such a panacea, that more dentists are not using this material? I think the percentage that follows his method is about one out of five hundred, possibly less." In answering the discussion I said it was just the question I wanted to have asked

me, as it gave me a chance. I said, "Gentlemen, I have not claimed for non-cohesive gold this quality; it won't cure rheumatism and make you a bicycle-rider at the same time, but it will save teeth of a lower grade of structure than will any other material. It is true that the tendency of the times is toward machinery. A machine is a beautiful thing to use, and if you want to make two things exactly alike you can make them better with a machine and more accurate; but if you want to make an ideal thing, there is no machine better than that which God gave you, these three fingers" [indicating the thumb and the first and second fingers].

The dental engine is a mixed blessing to the dentist. It saves time, nerves, and teeth, but in the hands of the ungodly what doesn't it do! Gentlemen, many teeth are cut off and crowned simply because the dentist has not the skill to fill the tooth in the proper manner, and with the engine it is easier to cut off and crown, therefore they are cut off. Now, when you fill a bad tooth and save it for ten years, and then crown it, you have lengthened the life of the tooth the length of time the filling lasts.

If there were no dental engine there would be no dental parlors today. Without it also the dental profession would go back to the old days. Still, it is a great blessing for one who knows how to use it. The rubber dam is another great blessing that we did not have in my day. The great fault of the rubber dam is, that in putting it on several teeth to fill, the teeth will get unnaturally dry, and you are filling some of the teeth in an unnatural condition. The tooth is thirsting for a drink, and when the rubber dam is taken off that

tooth it is going to have a drink. Where does it get that drink from? Not through the apex of the tooth, but from the fluids of the mouth. Gentlemen, keep the tooth wet, but keep the cavity as dry as you can get it.

Another thing I would say to the younger men of the profession: Dentistry offers a great opportunity for the future. I wish to Heaven I were a young man just starting out now! The prospects of the future we cannot prophesy. One thing I would say to the young man: Whatever you do in dentistry, whether cleaning or polishing teeth, making amalgam or gold fillings, do the common things uncommonly well. Let your motto be to make everything perfect. There is no time wasted in preparing your cavities perfectly, especially the marginal walls. Unless you have your cavities perfectly prepared you cannot make a perfect filling.

In my talk I may have seemed egotistic. Gentlemen, I am not; I am simply giving the results of the work of one who knows very little about dentistry, but something of saving teeth with non-cohesive foil. I have done conscientious work in this line for forty years. I have used Abbey's non-cohesive gold foil for forty years, and I have children of patients for four generations come to me and have their work done, and I have not a single regret for having followed this line of work. I have seen teeth beautifully kept for many years with non-cohesive gold, and I cannot say too much to induce you to start this line of work.

Mr. President, I thank you for the privilege of being here, and the members for their kind attention to me in my talk, and congratulate the society on its success in its fortieth year.

DISCUSSION.

Dr. A. J. FLANAGAN, Springfield, Mass. We men in Massachusetts esteem and revere manhood, and when we say we esteem and revere manhood it is unnecessary for us to say that we esteem and revere Dr. Gerrish. He has, I believe, for some years been known under the sobriquet of the "sage of New Hampshire," and if there be any one man deserving of that title, that man is Dr. Gerrish. Dr. Gerrish in his trite New England way quoted much philosophy, and while he was discussing the merits of non-cohesive gold, my mind went back to the time I spent in Philadelphia, when we had the philosophical Dr. Garretson, and I was reminded of another trite saying—one of Dr. Garretson's—which, as well as I remember it, was, "A thing is to the sense that sees it as to that sense it seems to be." If you will analyze Dr. Gerrish's talk you will find that the essayist fulfills that trite and philosophical saying of Dr. Garretson.

In speaking of the relative qualities of gold, Dr. Gerrish forgets that everything in this world is relative; everything is good or bad as one may see it. For instance, the orthodoxy of John Jones may be the heterodoxy of John Smith, with relatively both correct. When many a young man goes out to practice, dentistry is to his sense something that is seen not in relation to manhood, but to dollars and cents. When a patient goes into the office of Dr. Gerrish it is simply a question, under the honorable methods of Dr. Gerrish, of the salvation of the teeth, and not the size of his pocket-book. Dr. Gerrish practices dentistry from the standpoint of philanthropy, and when

a patient comes to him he uses non-cohesive gold simply because he is satisfied that in his hands he can save teeth better with non-cohesive gold than any other material. It is not a question of how much money there is in it for him, but it is a question of the salvation of the teeth. If every man would take non-cohesive gold, or any other material, and practice the same as Dr. Gerrish, he would relatively do as much good as does Dr. Gerrish. The whole question depends entirely upon the man. Dr. Gerrish has been rather modest when he says that it is not the man in his case, but the material which he uses; but it is just the man back of all this.

Dr. Gerrish, without doubt, can do wonders with non-cohesive gold, but he is at odds with the trend of mind on the question of bacteria. He made the statement that if he seals the periphery of the cavity it does not make any difference if there be a space within. I believe that science teaches us that all bacteria may be divided into two classes, aerobic and anaerobic, those that live in air and those that live without air. Now, if Dr. Gerrish be right, science is at fault, because if these germs are pinned into a space and can live without air, we will surely have damage resulting. That is but the one point in the paper that was unscientific, or that might be criticized. He said in the beginning that it was a practical talk because it was unscientific, but I say that nothing can be practical unless it is scientific.

Another question to be considered is that Dr. Gerrish in the saving of teeth practices for people who can afford to pay

good fees for his work, and he is able to limit his practice to a certain number each day. The average man who can afford to limit his practice to a certain number each day can do phenomenal work, while if it be unlimited he cannot do as well, and I doubt if a man with an unlimited practice could do as good work with non-cohesive as with cohesive gold under like conditions.

Dr. JAS. McMANUS, Hartford. I have known Dr. Gerrish for a great many years, and I believe he can back up every statement made here today. Whether a man calls it practical or scientific I do not care, but simply to save teeth is the mission of the dentist, and his mission is to save teeth in the most serviceable manner possible. From the little experience I have had in my life, and in watching the operations of others, I can say that most of the operations that I have ever seen that lasted much over twenty years were non-cohesive gold operations. That is quite a statement to make, but it is true. I have seen Maynard's operations, Harris's operations, and the operations of other men, that were made with soft foil and lasted from twenty to thirty and forty years. I have also seen many first-class operations with cohesive gold that would fail at the vulnerable point, that is the cervical margins; and I believe that more teeth can be saved by operating as Dr. Gerrish operates than in any other way, and saved for a longer time.

With regard to the engine and mallet, I have felt for years that the use of the engine and mallet have both been overdone, and that patients have suffered more than necessary on account of them. I think if more men would educate their fingers, as Dr. Gerrish says, more teeth would be saved and the public benefited.

Dr. G. M. GRISWOLD, Hartford. I am so heartily in sympathy with the spirit of the paper that I do not want to say anything in opposition to it. I regret to say, however, that my experience with non-cohesive foil has been very limited. Personally, I can build a better and a more substantial filling with cohesive gold than with the non-cohesive. I can say, however, with regard to the lasting qualities of non-cohesive gold, that in my own mouth I have a number of fillings of this material that were placed there twenty-three years ago, and I hope they will last the limit of thirty-eight years given by Dr. Gerrish. I can, on the other hand, report fillings made by myself that I placed in twenty-two years ago—cohesive gold—with the results excellent up to today.

Dr. S. H. GUILFORD, Philadelphia, Pa. It is very hard to discuss a paper of this kind, or to say anything that may seem to antagonize the views advanced by the essayist when he is evidently such a sincere man and one who thoroughly believes what he says, and yet on the other hand it struck me as a strange contrast that only a few weeks ago, in the city of New York, a paper was read by Dr. C. N. Johnson upon the subject of the preparation of compound cavities in bicuspids and molars and the methods of filling them, which advocated extensive cutting and the combined use of cohesive and non-cohesive foil; whereas in the paper just listened to we are advised to cut sparingly and confine ourselves, in simple cavities, to the use of non-cohesive gold. Dr. Johnson advocated much cutting away of the tooth-structure in order to get the cavity large enough for the operator to work with ease, and also to prevent future decay. The system he advocated would seem to represent one

extreme, whereas the paper by Dr. Gerish represents the other extreme. It may be said that there is nothing in this world absolutely good or absolutely bad. There is something good, and something less good, in every method and every material. Everything that has been said today in regard to non-cohesive gold is largely true, and yet just as much could be said for the use of cohesive gold. One of the previous speakers spoke of having seen fillings done with non-cohesive gold that had lasted from twenty to thirty and forty years, but it should be remembered that these operations came from the hands of masters—Dwinelle and others—who were very skilful operators. We hear only of the successes of these men; the failures have never been mentioned, although there must have been some.

I can easily understand how Dr. Gerish obtains such good results from this material. He has used it carefully and skilfully for many years, and it has served him well. He seems as thoroughly welded to the method as the gold was to the dentin in the case shown by Dr. Shepard.

We must remember, however, in advocating the different methods of operating, that in the teaching of students we cannot teach them how to become expert non-cohesive-gold operators and at the same time expert cohesive-gold manipulators. It is impossible to teach both thoroughly, and the question arises, Which shall we choose? Shall we teach the method that was in vogue forty years ago, when the engine was unknown, when the rubber dam was not in use and cavities could not be kept dry, and when all the conditions were different, or shall we teach them the method which is in most favor at the present time? In this world we are governed in all our actions by the

tendency of the times. There is no reason why we should not be wearing buckled shoes, silk stockings, and knee-breeches, for they would probably be as comfortable now as they were seventy-five years ago, but the fashion has changed, and the people have changed in their views. In whatever we do we must needs be governed largely by what those do around us, and the tendency of the times is toward the use of cohesive gold in a limited sense.

The essayist spoke of using non-cohesive gold for the greater portion of the filling, and finishing with cohesive gold in certain cases. Now, it would seem that if non-cohesive gold is good it would be better at the periphery of the filling than anywhere else, and should be used all the way through the operation. Many years ago I had a conversation with Dr. Cushing, celebrated for his perfect operations with non-cohesive gold, and I said to him, "Doctor, do you use nothing but non-cohesive gold?" "By no means," he replied, "I seldom use non-cohesive gold alone. I use it for the greater part of the filling, and finish with cohesive gold."

A long while ago the manufacturers recognized the good features of both varieties of gold, and began experimenting with the object of producing a gold that would be a compromise between the two, possessing the good qualities of both and discarding the objectionable qualities of each; and there came into existence, as the result of this experimental work, a variety of foil known as semi-cohesive. In ordinary conditions it was non-cohesive, but with the application of a little heat it could be made cohesive. I have been using it almost entirely since it was placed upon the market, and I believe it is the best gold for the student to be taught to use in order to produce the best

results. Dr. McManus said that twenty years ago the fillings were all of the non-cohesive variety. I do not think that is so, as I find fillings put in twenty-five and thirty years ago that were done with cohesive gold. I am satisfied that the success of the operations depends not so much on the material as upon the operator.

One other point Dr. Gerrish made was that by the use of non-cohesive gold the extreme separation of the teeth was avoided. In other words, that with a limited amount of space you could operate with non-cohesive gold where you could not with cohesive gold. That is certainly true, but at the same time we know that teeth as they present to us are very liable to re-decay at certain points, and that for that reason cavities should be more extended than they have been in the past. If that be done the point made by the essayist will have little weight. We generally try to keep the cavity within reasonable bounds, but at the same time we must extend it sufficiently to guard against future decay—so that working in a limited space will not appeal to many of us.

Undoubtedly, it requires more skill to succeed in the use of non-cohesive gold than with cohesive, and that is why the average student prefers the latter. He feels that he can attain proficiency much more readily with one than with the other.

After all, however, good results are what we are striving for, and the method matters but little.

Dr. JAS. McMANUS, Hartford. I do not want to be misunderstood. It is very well to speak of teeth filled a long time ago, but in speaking of these operations we should go beyond the simple cavities. It is easy enough to put a simple filling

in a bicuspid or molar on the occlusal surfaces, but the great necessity for good work is in approximal cavities; and I think we all agree that deep-seated approximal cavities are the most difficult of all cases we have to deal with. There is where I claim that Dr. Gerrish's method is more likely to be lasting and successful. Everybody knows that Dr. Guilford is an exceptionally skilful operator, but there were men in the old days who used soft foil who filled these different and difficult cavities, and filled them successfully with soft foil. They did the same thing with tin foil. I have one case in mind of a filling on the buccal surface of an upper second molar, in which a tin filling put in by Dr. Dwinelle lasted for forty years. It was the man in that case. The tin filling was put in on the same principle that Dr. Gerrish uses with soft foil. When we are looking for lasting operations we should not speak of simple fillings, but fillings on buccal surfaces away down at the cervical margins and approximal fillings between bicuspid and molars.

Dr. E. H. SMITH, Boston, Mass. This is the second time I have had the pleasure of listening to Dr. Gerrish. I liked him the first time, and like him better this time. There is something about his sincerity of manner that I admire. When I was a student the cohesive method of filling teeth was at its height. It was all cohesive gold. I used cohesive gold and nothing else. It was at the time when we were taught to make those wicked little retaining pits. We began by packing the little retaining pit carefully with little bits of cohesive gold, and continued to the end with cohesive gold.

One of the speakers referred to Dr. Gerrish as an extremist in his method of using gold. The extremist does good by

fixing the mind on some particular principle. It is for us to extract from these extremists what is best in each case. I think, however, that the majority of practitioners are conservative in their methods, and use both the cohesive and the non-cohesive varieties of gold. If I understood Dr. Gerrish correctly, I think he said he used both kinds of gold.

Dr. GERRISH. Every day in the week.

Dr. SMITH. When he began to practice there was no such thing as cohesive gold. When the cohesive gold was brought out he used it and has benefited by it, but has not allowed himself to be led astray by it. Now, I think the extreme methods of non-cohesive and cohesive gold have led us to a modification of both methods, and we now use them in combination, with great success.

I want to point out one error with regard to teaching as presented by Professor Guilford, where he claims that the student should be taught one method alone, on the ground that we have not time to teach more than one method. I do not agree with Professor Guilford. To be sure his theory would hold good if it was our purpose to make expert operators in one method only, but to my mind that is not the idea of dental education. The idea should be to make all students competent in all the different operations. We cannot hope to make them as skilful as is Dr. Gerrish with non-cohesive gold, or as expert as Dr. Guilford with cohesive. We should, however, teach the different methods and instill above everything else the principle underlying the saving of teeth.

As Dr. Gerrish says, non-cohesive gold, properly used, saves teeth, and we owe it to our patients to save for them everywhere we can, and non-cohesive gold in skilful hands will not only save teeth,

but also the time of the operator and of the patient as well.

Dr. C. B. ERICHSON, New Britain. One thought occurred to me in this matter; that is, that the pith of Dr. Gerrish's paper was that the success in operating was in the man, and not in the material. The success he has had with non-cohesive gold would be likewise with any other man of his ability. It is not so essentially the material as the method of application, the character of preparation of the cavities, and the thoroughness of the operations.

I have attended dental conventions since 1864, and at every convention I hear the same old story. When I was a young man I would go to conventions, and after hearing a man make his claims for certain materials and methods I would come to the conclusion that he had the right thing, but it did not always work with me, and I soon learned that the secret of the success of any method was the thoroughness of application of the method, and that every man had to do thorough work in order to be successful. At the present time we have two classes of dentists, one class that is making hay while the sun shines, and the other doing business on a conscientious principle, exerting great care to get the best results from the operations in hand; and usually the latter is the man who is most successful in the long run.

Dr. G. A. MAXFIELD, Holyoke, Mass. I am convinced that it requires more skill to use non-cohesive gold than it does for cohesive gold, and it is for this reason that the majority of young men who go to college will use cohesive foil from the beginning. I know that at Harvard the student is taught both methods, but the majority of them will use cohesive gold because it is easier to work. I meet

very few students in examinations that use the soft gold. Six weeks ago, at the examination held by our board, we had students from fourteen different colleges, and not one of these students used non-cohesive gold in his practical examination. In filling cavities in central incisors with cohesive foil it necessitates making a large cavity, in order to enter from the bottom and build down. A gentleman—an advocate of cohesive gold—came into my office last Saturday afternoon just as I was preparing a cavity in a right central incisor, and seeing the shape of the cavity, asked how I was going to fill it. I told him I would fill the bulk of the cavity with non-cohesive gold and finish with cohesive, and while we were talking about it I had the tooth filled with non-cohesive gold and finished it with cohesive, and he was astonished at the short time in which I did the work. I am certain that a good non-cohesive gold filling will preserve a tooth longer than a cohesive gold filling; and besides that, it is not right to make the patient sit under the long strain of a cohesive gold operation when we can do in from fifteen minutes to three-quarters of an hour what would otherwise take over an hour to do. Again I emphasize that it is not best for the operator or the patient to spend the time with cohesive foil when one can do it better and quicker and much easier with non-cohesive foil, although it does require more skill.

There is another thing to be considered in the question of saving the teeth, and that is the question of what Dr. Atkinson would call "retrograde metamorphosis." Some eighteen years ago I had occasion to do a great deal of gold work for a patient. That patient afterward moved to another city in the state, and two years ago last summer this patient went to a

friend of mine to have some of the fillings replaced that were coming out. He made the remark at the time of replacing the fillings that if his fillings stayed in for fifteen years he would feel that he had done well. Last summer this patient went back to him with some of these later fillings coming out, and the patient could not understand why those fillings did not stay as well as mine. What was the matter? It was a case of retrograde metamorphosis. Some patients have fillings in their mouths lasting forty and fifty years, and it is because the teeth do not undergo retrograde metamorphosis. Some time ago, in discussing Dr. Black's conclusions in regard to the characteristics of the human teeth, I made the point that there is degeneration taking place in the teeth at certain times of life, and we should take that into account when we are summing up these things.

Dr. GUILFORD. I want to correct an impression gathered by Dr. Smith from my remarks. I did not wish to convey the idea that students should be taught only one method; what I meant to say was that, while we teach the different methods, and have these methods fully explained to our students, we give particular prominence to one special method. I believe that it is impossible to teach the student to operate by both methods equally well. I was much impressed by a remark made by Professor Truman many years ago. He said that the college course was too short in which to teach men the different methods of operating. The object is to make them as proficient as possible in one method. In my teaching I have taken pains to illustrate and demonstrate the advantages of the different methods as well as I could, believing at the same time that if we take a student from the time he

matriculates, and teach him one method thoroughly, he will do better work by that method. We should teach all of the different methods, but give prominence to one special method.

Dr. D. GENESE, Baltimore, Md. I would like to say one word on this question, and that is that the essayist and all the gentlemen answering him have lost sight of one point, viz, that we should be eclectic. There is no individual method that overbalances all others. We have to get acquainted with the materials we use before we can apply any method successfully. We often see gold coming from the same manufactory differing in its character according to the day on which we are using it. And again, the dexterity of the operator may not be the same on one day as another.

A man who has been under a great strain of work in the morning would do well not to work in the afternoon, otherwise he will likely spoil what would under other conditions be a perfect filling.

Dr. GERRISH (closing the discussion). I feel very highly honored for the attention given to me both in the reading of my paper and the discussion of the same. Indeed, I feel that you have given me too much attention. As I said in the beginning of my paper, sink me out of the equation. I take the ground that it is the material, and not the man.

On motion the subject was passed, and the society listened to a paper by Dr. EUGENE H. SMITH, Boston, Mass., entitled "Preliminary Requirements to Dental Education," as follows:

PRELIMINARY REQUIREMENTS TO DENTAL EDUCATION.

By E. H. SMITH, D.M.D., Boston, Mass.

THE mind of man properly trained is a great power for good, and the ages teach us that we advance through education. Assembled here today, in this home city of Wells, the dental benefactor, are members of the dental profession eager to improve themselves and ambitious to elevate the status of their profession.

My mission, then, is to point out to you the first step to a higher professional standing. This step we consider best at Harvard, and propose to put it into practice next June.

In order that you may fully understand what the higher requirements for entrance mean, let me briefly state the present entrance requirements to schools holding membership in the National Association of Dental Faculties.

Rule 1st of the Code of Rules of the National Association of Dental Faculties reads:

"The minimum preliminary educational requirements of colleges of the Association, beginning with the session of 1902-1903, shall be a certificate of entrance into the third year of a high school, or its equivalent."

This means simply that a person having spent two years in any high school, and having passed the examinations of

those two years, is eligible to enter upon the study of dentistry. Every educator knows that this is an uncertain standard. In the first place there is absolutely no educational standard for high schools excepting in Massachusetts, and in a few other states, where the law is such that the high schools must be of a standard to fit a boy to enter a reputable college of letters.

An attempt, however, to advance the preliminary requirements was made at the last meeting of the National Association of Dental Faculties, and the following resolution to that end was offered:

RESOLVED, That the following preliminary examinations shall be required of students seeking admission to colleges of this Association:

"The minimum preliminary educational requirements of colleges of this Association, beginning with the session of 1904-1905, shall be a certificate of high-school graduation, or its equivalent."

Had this resolution passed it would have looked well on paper, but it was fatally weak in its high-school clause. It failed of adoption, and the matter of preliminary requirements was placed in the hands of the *Ad interim* Committee,

which is to make a report at the next annual meeting.

The discussion of this resolution was most interesting, as it clearly indicated a desire to protect the schools rather than to advance requirements. One member said, "I am opposed to any further advance in the requirements until our present requirements are carried out." Another said, "I do not want to be elassed as a man who is opposed to higher education, but this association should go a little bit slow at this time. We are going to a four years' course, and if you advance the requirements for admission to the schools and make it higher, you work a hardship that the schools are not prepared for just at this time. I think we ought to rest where we are now and make the schools live up to the laws we have. We have enough laws which we in a measure violate."

Another, in opposing the resolution, said, "I speak as the dean of a young school, and would suggest to this association not to make such rules, out of consideration for the young schools. I think the young schools are striving as hard as the old schools; but do not make rules that will sink the young schools."

Thus you see that many of our educators are much concerned to preserve our schools.

The administrative board of the Harvard Dental School thinks the time has come when it should concern itself less about the number of dental schools in the United States and more about their quality, and believing that the quality is largely determined by the character of the men entering our schools it has decided to require for entrance in June next and thereafter the following:

Studies in which Examinations are Held.

Examinations for admission to Harvard Dental School will be held in the following subjects. Each candidate must offer studies amounting to 16 points. Sections 1, 2, 3, 4 are required. Electives may be chosen from Section 5.

The figure attached to each study indicates the relative weight (termed points) which will be given to it in determining the question of the candidate's fitness for admission.

1. English ($\frac{1}{4}$)
2. Physics (2)
3. Latin ($\frac{1}{4}$) or French (2) and English and American History (2)
or French (2) and Greek and Roman History (2)
or German (2) and English and American History (2)
or German (2) and Greek and Roman History (2)
4. Theoretical and Descriptive (Inorganic) Chemistry and Qualitative Analysis ($\frac{1}{4}$)

In addition he will be obliged to offer either—

5. Algebra (2)
Plane Geometry (2)
- Or any two of the following:—
- Solid Geometry (1)
 - Botany (1)
 - Zoölogy (1)
 - Anatomy, Physiology, and Hygiene (1)
 - Wood-working (1)
 - Blacksmithing (1)
 - Chipping, Filing, and Fitting (1)
 - Machine-tool Work (1)

The examinations in English, Physics, Latin, French, Greek and Roman History, English and American History, German, Algebra and Plane Geometry will be the same as those given in these subjects (elementary grade) for admission to Harvard College.

The examinations in Botany, Zoölogy, Anatomy, Physiology and Hygiene, Wood-working, Blacksmithing, Chipping, Filing and Fitting, Machine-tool work, will be the same as those given in these subjects for admission to the Lawrence Scientific School.

ENGLISH.

The examination will consist of two parts, which, however, cannot be taken separately:

- I. The candidate will be required to write

a paragraph or two on each of several topics chosen by him from a considerable number—perhaps ten or fifteen—set before him on the examination paper.

In 1904 and 1905 the topics will be drawn from the following works:

Shakespeare's *The Merchant of Venice* and *Julius Cæsar*; *The Sir Roger de Coverley Papers* in the *Spectator*; Goldsmith's *The Vicar of Wakefield*; Coleridge's *The Ancient Mariner*; Scott's *Ivanhoe*; Carlyle's *Essay on Burns*; Tennyson's *Princess*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*.

In 1906 the topics will be drawn from the following works:

Shakespeare's *Macbeth* and *The Merchant of Venice*; *The Sir Roger de Coverley Papers* in the *Spectator*; Irving's *Life of Goldsmith*; Coleridge's *The Ancient Mariner*; Scott's *Ivanhoe* and *The Lady of the Lake*; Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and *The Passing of Arthur*; Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*.

The candidate is expected to read intelligently *all* the books prescribed. He should read them as he reads other books; he is expected, not to know them minutely, but to have freshly in mind their most important parts. In every case the examiner will regard knowledge of the book as less important than ability to write English.

As additional evidence of preparation, the candidate may present an exercise-book properly certified by his instructor, containing compositions or other written work.

II. A certain number of books will be prescribed for careful study. This part of the examination will be upon subject-matter, literary form, and logical structure, and will also test the candidate's ability to express his knowledge with clearness and accuracy. The books prescribed for this part of the examination in 1904 and 1905 are—

Shakespeare's *Macbeth*; Milton's *Lycidas*, *Comus*, *L'Allegro*, and *Il Penseroso*; Burke's *Speech on Conciliation with America*; Macaulay's *Essays on Milton* and *Addison*.

The books prescribed for this part of the examination in 1906 are—

Shakespeare's *Julius Cæsar*; Milton's *L'Allegro*, *Il Penseroso*, *Comus* and *Lycidas*; Burke's *Speech on Conciliation with America*;

Macaulay's *Essay on Milton*, and *Life of Johnson*.

No candidate will be accepted in English whose work is seriously defective in point of spelling, punctuation, grammar, or division into paragraphs.

In connection with the reading and study of the prescribed books, parallel or subsidiary reading should be encouraged, and a considerable amount of English poetry should be committed to memory. The essentials of English grammar should not be neglected in preparatory study.

The English written by the candidate in any of his examination-books may be regarded as part of his examination in English, in case the evidence afforded by the examination-book in English is insufficient.

PHYSICS.

A course of study dealing with the leading elementary facts and principles of Physics, with quantitative laboratory work by the pupil.

The instruction given in this course should include qualitative lecture-room experiments, and should direct especial attention to the illustrations and applications of physical laws to be found in every-day life. The candidate is required to pass a written examination, the main object of which will be to determine how much he has profited by such instruction. This examination may include numerical problems. It will contain more questions than any one candidate is expected to answer, in order to make allowance for a considerable diversity of instruction in different schools.

The pupil's laboratory work should give practice in the observation and explanation of physical phenomena, some familiarity with methods of measurement, and some training of the hand and the eye in the direction of precision and skill. It should also be regarded as a means of fixing in the mind of the pupil a considerable variety of facts and principles. The candidate is required to pass a laboratory examination, the main object of which will be to determine how much he has profited by such a laboratory course.

The candidate must name as the basis for his laboratory examination at least thirty-five exercises selected from a list of about sixty, described in a publication issued by the University under the title, "Descriptive List

of Elementary Exercises in Physics." In this list the divisions are mechanics (including hydrostatics), light, heat, sound, and electricity (with magnetism). At least ten of the exercises selected must be in mechanics. Any one of the four other divisions may be omitted altogether, but each of the three remaining divisions must be represented by at least three exercises.

The candidate is required to present a note-book in which he has recorded the steps and the results of his laboratory exercises, and this note-book must bear the endorsement of his teacher, certifying that the notes are a true record of the pupil's work. It should contain an index of the exercises which it describes. These exercises need not be the same as those upon which the candidate presents himself for the laboratory examination, but should be equivalent to them in amount and grade of quantitative work.

The note-book is required as proof that the candidate has formed the habit of keeping a full and intelligible record of laboratory work through an extended course of experiments, and that his work has been of such a character as to raise a presumption in favor of his preparation for the examination. But much greater weight will be given to the laboratory examination than to the note-book in determining the candidate's attainments in physics. Experience has shown that pupils can make the original record of their observations entirely presentable, so that copying will be unnecessary, and they should in general be required to do so.

This course, if taken the last year of the candidate's preparation, is expected to occupy in laboratory work, recitations, and lectures, five of the ordinary school periods, about fifty minutes in length, per week for the whole year. With few exceptions, exercises like those in the Descriptive List already mentioned can be performed in a single school period, but for satisfactory results it will often be necessary to repeat an exercise. Two periods per week for the year should be sufficient for the laboratory work proper. If the course is begun much earlier than the last year of the candidate's preparation, as it well may be, it will require more time.

A candidate who offers Physics will hand in his laboratory note-book at *the hour of the laboratory examination*. Laboratory note-

books will be deposited, after examination, in the College office, where they will be kept for a reasonable time, subject to the order of the owners.

A candidate examined in June at any place where a laboratory examination is not provided will be required to take such an examination in Cambridge in the autumn, but if he passes the written examination in June and presents a satisfactory note-book, the subject will be temporarily counted in his favor in determining the question of his admission to the School.

LATIN.

The examination will be adapted to the proficiency of those who have studied Latin in a systematic course of five lessons a week, extending through at least *three* school years. The two parts of the examination cannot be taken separately:

(a) The translation at sight of simple Latin prose and verse. (The passages set for translation must be rendered into simple and idiomatic English.)

(b) A thorough examination on a prescribed portion of Cicero's speeches (about thirty pages), directed to testing the candidate's mastery of the ordinary forms, constructions, and idioms of the language; the test to consist, in part, of writing simple Latin prose, involving the use of such words, constructions, and idioms only as occur in the speeches prescribed.

The portion of Cicero prescribed for this examination is the second, third, and fourth speeches against Catiline. Two years' notice will be given of any change in the selection.

GERMAN.

(a) The translation at sight of simple German prose. (The passages set for translation must be rendered into simple and idiomatic English.)

(b) The translation into German of simple English sentences, or of easy connected prose, to test the candidate's familiarity with elementary grammar.

The passages set for translation into English will be suited to the proficiency of candidates who have read not less than two hundred pages of easy German (including reading at sight in class).

Grammar should be studied concurrently with the reading as an indispensable means of ensuring thoroughness and accuracy in the understanding of the language. The requirement in elementary grammar includes the conjugation of the weak and the more usual strong verbs; the declension of articles, adjectives, pronouns, and such nouns as are readily classified; the commoner prepositions; the simpler uses of the modal auxiliaries; the elements of syntax, especially the rules governing the order of words.

Pronunciation should be carefully taught, and the pupils should have frequent opportunities to hear German spoken or read aloud. The writing of German from dictation is recommended as a useful exercise.

FRENCH.

(a) The translation at sight of ordinary Nineteenth Century prose. (The passages set for translation must be rendered into simple and idiomatic English.)

(b) The translation into French of simple English sentences or of easy connected prose, to test the candidate's familiarity with elementary grammar. Proficiency in grammar may also be tested by direct questions, based on the passage set for translation under (a).

The passage set for translation into English will be suited to the proficiency of candidates who have read not less than four hundred pages (including reading at sight in class) from the works of at least three different authors. It is desirable that a portion of the reading should be from works other than works of fiction.

Grammar should be studied concurrently with the reading as an indispensable means of ensuring thoroughness and accuracy in the understanding of the language. The requirement in elementary grammar includes the conjugations of regular verbs, of the more frequent irregular verbs, such as *aller, envoyer, tenir, pouvoir, voir, vouloir, dire, savoir, faire*, and those belonging to the classes represented by *ouvrir, dormir, connaître, conduire*, and *craindre*; the forms and positions of personal pronouns and of possessive, demonstrative, and interrogative adjectives; the inflection of nouns and adjectives for gender and number, except rare cases; the uses of articles, and the partitive constructions.

Pronunciation should be carefully taught, and the pupils should have frequent opportunities to hear French spoken or read aloud. The writing of French from dictation is recommended as a useful exercise.

THEORETICAL AND DESCRIPTIVE (INORGANIC) CHEMISTRY AND QUALITATIVE ANALYSIS.

Each candidate will be required to pass a written examination in Theoretical and Descriptive (Inorganic) Chemistry and will be required to hand in, at the hour of this written examination, the original note-book in which he recorded the work performed by him at school in Qualitative Analysis. This note-book must give evidence that the student has had practice in the analysis of solutions and solids containing several salts, and must bear the endorsement of his teacher, certifying that the notes are a true record of his work.

HISTORY (INCLUDING HISTORICAL GEOGRAPHY).

Either of the two following groups, each including two fields of historical study:

1. *Greek and Roman History*.—(a) Greek History to the death of Alexander, with due reference to Greek life, literature, and art. (b) Roman History to the accession of Commodus, with due reference to literature and government.

2. *English and American History*.—(a) English History, with due reference to social and political development. (b) American History, with the elements of Civil Government.

For preparation in each of the two historical fields presented, a course of study equivalent to at least three lessons a week for one year will be necessary.

The candidate will be expected to show on examination such general knowledge of each field as may be acquired from the study of an accurate text-book of not less than 300 pages, supplemented by suitable parallel readings amounting to not less than 500 pages. The examination will call for comparison of historical characters, periods, and events, and in general for the exercise of judgment as well as of memory. Geographical knowledge will be tested by means of an outline map.

ALGEBRA.

Algebra, through Quadratic Equations.

The requirement in Algebra includes the following subjects: factors, common divisors, and multiples, fractions, ratios and proportions; negative quantities and the interpretation of negative results; the doctrine of exponents; radicals, and equations involving radicals; the binomial theorem for positive integral powers of the binomial, and the extraction of roots; putting questions into equations and the reduction of equations; the ordinary methods of elimination and the solution of both numerical and literal equations of the first and second degrees with one or more unknown quantities and of problems leading to such equations.

The student should cover carefully the whole ground here specified, and should acquire a thorough understanding not only of the practice, but of the reasons involved in the elementary algebraic rules; for example, in the rules of multiplication, of signs, and of exponents, in the rules for fractions, and in those relating to the reduction and solution of equations. He should train himself to practical skill by the solution of a large number of examples, and should learn to do his work with reasonable quickness, as well as with confidence, accuracy, and clearness. The solution of fairly complicated literal quadratics, the various methods of elimination for equations of the first two degrees, the putting of problems in a neat manner into equations, and the working of the various algebraic operations both for integral and fractional expressions may be mentioned as important subjects of attention. The student should be taught to arrange his work in a clear, orderly, and compact fashion.

The time supposed to be devoted to the systematic study of the requirement in Algebra is the equivalent of a course of three lessons a week through two school years.

GEOMETRY.

Plane and Solid Geometry, including problems in mensuration of plane and solid figures, and original propositions in Plane Geometry.

Geometric education should begin in the kindergarten or primary school, where the child should acquire familiarity through the

senses with simple geometric forms, by inspecting, drawing, modeling, and measuring them, and noting their more obvious relations. This study should be followed, in the grammar school, by systematic instruction in Concrete (or Observational) Geometry, of which geometric drawing should form a part. Such instruction should include the main facts of Plane and Solid Geometry, treated as matters of observation, and not as exercises in logical deduction, without however necessarily excluding the beginnings of deductive proof as soon as the pupil is ready for them. Concrete Geometry is believed to have important educational value, and to prepare an excellent foundation for the later study of Formal Geometry. It belongs, however, to the earlier stages of school work, and should not be postponed until the time that belongs to direct preparation for college or the scientific school.

In teaching Formal Geometry, stress should be laid from the outset on accuracy of statement and elegance of form, as well as on clear and strict reasoning. As soon as the pupil has begun to acquire the art of rigorous demonstration, his work should cease to be merely receptive; he should be trained to devise constructions and demonstrations for himself, and this training should be carried through the whole of the work in Plane Geometry. Teachers are advised, in their selection of a text-book, to choose one having a clear tendency to call out the pupil's own powers of thought, prevent the formation of mechanical habits of study, and encourage the concentration of mind which it is a part of the discipline of mathematical study to foster. The subject of Geometry, not a particular treatise, is what the pupil should be set to learn; and its simpler methods and conceptions should be made a part of his habitual and instinctive thought. Lastly, the pupil should be stimulated to good work by interest in the study felt and exhibited by the teacher.

The requirement in Geometry embraces the following topics: The general properties of plane rectilinear figures; the circle and the measure of angles; similar polygons; areas; regular polygons, and the measure of the circle; the relations of planes and lines in space; the properties and measure of prisms, pyramids, cylinders, and cones; the sphere and the spherical triangle. The propositions required under these several heads are those

only which are contained in the older treatises, and which are recognized as constituting the Elements of Geometry. The examination does not include the additions introduced into some recent text-books, although most of those additions are in themselves valuable for the student who has time and taste for extra study in this field. A syllabus of the required propositions has been prepared. [*This syllabus may be obtained, price 10 cents, at the Publication Office, 2 University Hall, Cambridge.*]

The examination in Geometry also includes original propositions in Plane Geometry, based on the propositions named in the syllabus, and problems in mensuration in both Plane and Solid Geometry; but excellence in book-work and in exercises immediately illustrating book-work will be allowed to offset in part any lack of skill in original work.

The time which it is recommended to assign to the systematic study of the requirement in Formal Geometry is the equivalent of a course of five lessons a week for one school year; but it is believed to be advisable to extend this allowance of time over two years.

PLANE GEOMETRY.

The requirement in Plane Geometry is stated on pages 1-14 of the Syllabus mentioned above.

SOLID GEOMETRY.

Chavenet's Geometry, revised and abridged (Philadelphia: J. B. Lippincott Co.), Books VI, VII, VIII, and IX, will serve to indicate the nature and amount of the requirement in Solid Geometry.

ANATOMY, PHYSIOLOGY, AND HYGIENE.

A course of study and laboratory work equivalent to that described in a pamphlet entitled "An Outline of Requirements in Anatomy, Physiology, and Hygiene," issued by the University.

The candidate will be required to pass both a written and a laboratory examination. The written examination will test the range and thoroughness of his knowledge of the elements of Anatomy, Physiology, and Hygiene. The laboratory examination will test (a) his ability to perform the experiments described

in the Outline of Requirements, and (b) his knowledge of the first aids to be rendered to the injured.

At the time of the laboratory examination the candidate must present the original note-book containing (with dates) the notes and drawings he has made in the course of his laboratory work, and bearing the endorsement of his teacher, certifying that the book is a true record of the pupil's own observations and experiments. An index of subjects should be appended.

BOTANY AND ZOÖLOGY.

Botany.—A course of study and laboratory work equivalent to that indicated in an "Outline of Requirements in Botany," issued by the University. The course should extend through at least half of a school year, with five lessons a week. The laboratory work is to be directed especially to the external anatomy and the activities of our common plants.

Zoölogy.—A course of study and laboratory work equivalent to that described in a pamphlet entitled "An Outline of Requirements in Zoölogy," issued by the University. The course should extend through at least half of a school year, with five lessons a week, and should include the laboratory study of at least ten types of animals, with special reference to their external anatomy and their activities. These types are to be selected in accordance with directions given in the pamphlet named.

In Botany and Zoölogy the candidate will be required to pass both a written and a laboratory examination. The written examination will test the range and thoroughness of his knowledge of the subject. The laboratory examination will test his skill in observation and experimentation, and his ability to apply names properly to the parts of the organisms studied.

At the time of the laboratory examination the candidate must present the original note-book containing (with dates) the notes and drawings he has made in the course of his laboratory work, and bearing the endorsement of his teacher, certifying that the book is a true record of the pupil's own observations and experiments. An index of subjects should be appended.

SHOPWORK.

A course of instruction in the use of tools and in the ordinary processes employed in the working of wood or metal, equivalent to that described in a pamphlet entitled "An Outline of Requirements in Shopwork," issued by the University. The course may embrace one or more of the following divisions:

Wood-working;
Blacksmithing;
Chipping, Filing, and Fitting;
Machine-tool Work.

The candidate must be familiar with the name, construction, and operation of the tools commonly used in these processes, and will be expected to read ordinary mechanical drawings and to make freehand sketches of articles which are to be produced in the workshop.

The candidate is required to pass both a written and a laboratory examination. The written examination will test his knowledge of tools and mechanical processes, and of the properties of materials of common use in construction. He will be expected to show familiarity with approved methods for simple work in the branch in which he presents himself for examination, and to write an intelligible description of those methods, illustrated by such sketches as may be necessary to make them clear. The laboratory examination will test the candidate's skill in the use of tools. He will receive the materials and specifications for a piece of work, and will be expected to select his tools, preparing them for use if necessary, and to demonstrate satisfactorily his knowledge and skill.

Every candidate is further required to present the original note-book in which he entered the descriptions and sketches of the work he performed at school; and with this he may present, as evidence of his skill in the workshop, the models made by him at school. Both the note-book and the models must be accompanied by the endorsement of his teacher, certifying that the book is a true record, and that the models are specimens of the pupil's own work.

You will observe that we require for entrance descriptive chemistry and qualitative analysis, a subject that is taught

in every other dental school in the country.

A superficial comparison of our present requirements with those of our past, or with the present requirements of other schools, might lead to the opinion that ours represent but a slight advance. Indeed, in an elaborate editorial, the editor of the *International Dental Journal*, issue for March 1904, so states it, and submits his proof by comparing the requirements of the Harvard Dental School with those of the University of Michigan College of Dentistry and those of the University of Pennsylvania Department of Dentistry.

In making that comparison he presents the requirements of the Harvard Dental School as follows:

The 16 counts previously alluded to are as follows: English, 4; Physics, 2; Latin, 4; or, French, 2, and English and American History, 2; or, French, 2, and Greek and Roman History, 2; or, German, 2, and English and American History, 2; or, German, 2, and Greek and Roman History, 2; Theoretical and Descriptive (Inorganic) Chemistry and Qualitative Analysis, 4. In addition, the candidate will be obliged to offer either Algebra (2), Plane Geometry (2), or any two of the following: Solid Geometry (1), Botany (1), Zoölogy (1), Anatomy, Physiology, and Hygiene (1), Wood-working (1), Blacksmithing (1), Chipping, Filing, and Fitting (1), Machine-Tool Work (1).

And further adds:

The examination in English is nearly identical with that for the Department of Dentistry of the University of Pennsylvania.

You will notice that the editor does not go into particulars as to the scope of the Harvard examinations in English, physics, etc., while he does go into detail in submitting the requirements of the University of Michigan College of Dental Surgery and those of the University

of Pennsylvania Department of Dentistry, as follows:

MICHIGAN.

English: An essay of not less than five hundred words, correct in spelling, etc.

History: Myers's General History, or an equivalent, and McLaughlin's History of the American Nation.

Mathematics: (a) *Arithmetic:* Fundamental Rules, Fractions (common and decimal). Denominate Numbers, Percentage, Proportion, Involution and Evolution; and the Metric System of Weights and Measures. (b) *Algebra:* Fundamental Rules, Fractions, Equations of the First Degree, containing two or more unknown quantities. (c) *Geometry:* Plane Geometry. (d) *Trigonometry:* Plane Trigonometry.

Physics: An amount represented by Avery's Natural Philosophy or Carhart and Chute's Elements of Physics.

Chemistry: General Inorganic, such as is given in Freer's or in Remsen's Elementary Chemistry.

Latin: Jones's First Latin Book, or Harkness's Latin Reader, or an equivalent amount in any other text-book, and four books of Cæsar. One year's work in German or French may be substituted for the second year of Latin.

The applicant must also offer two of the following subjects: Botany, Zoölogy, Physical Geography, and Physiology.

PENNSYLVANIA.

English: This is practically the same as Harvard.

History: (a) American History, with the elements of Civil Government. (b) General History, including Greek, Roman and English History.

Mathematics: (a) *Algebra:* Fundamental operations; factors; common divisors and multiples; fractions; equations of the first degree, with one or more unknown quantities; quadratic equations; the binomial theorem. (b) *Plane Geometry:* as in Wentworth or Phillips and Fisher.

Physics: As in Carhart and Chute or Gage's Elements.

Chemistry: As in Remsen's Elementary

Course in Chemistry or Arey's Elementary Chemistry will be accepted in lieu of Physics.

Latin: (1) A thorough course of elementary grammar. (2) Cæsar, or an equivalent course in German, French, or Spanish.

The Chemistry demanded by Harvard is part of the first-year course in this department.

He then adds that a comparative examination of the requirements of these three schools gives about the following in counts:

Harvard.

English	4
Physics	2
Inorganic Chemistry	4
Latin	4
Electives	2
	<hr/>
	16

Pennsylvania.

English	4
Physics	2
History	2
Latin	2
Algebra	2
Geometry	2
	<hr/>
	14

Michigan.

English	2
Physics	2
History	2
Chemistry	2
Latin	2
Science	2
	<hr/>
	12

It is plain, I think, to any fair-minded man that the numerical value of counts in the above table does not in any sense represent the difference in the standard of requirements.

The difference lies wholly in the preparation necessary to pass in the different subjects required.

To illustrate, take the English required by the University of Pennsylvania. Its catalogue reads:

English: (A) (1) *Grammar:* As in Abbott's How to Parse, or Murray's Advanced Lessons in English Composition, Analysis, and Gram-

mar. (2) *Composition*: A short essay, correct in spelling, punctuation, grammar, division by paragraphs, and in expression, written on a subject to be announced at the time of the examination.

(B) *Reading*: The candidate will be required to present evidence of a general knowledge of the following works and their authors: George Eliot's *Silas Marner*; Shakespeare's *Merchant of Venice*; Pope's *Homer's Iliad* (four books); The *Sir Roger de Coverley Papers* in the *Spectator*; Goldsmith's *The Vicar of Wakefield*; Coleridge's *The Rime of the Ancient Mariner*; Tennyson's *The Princess*; Scott's *Ivanhoe*; Lowell's *The Vision of Sir Launfal*; Cooper's *The Last of the Mohicans*.

The English required by the University of Michigan is—

An essay of not less than five hundred words, correct in spelling, punctuation, capital letters, grammar, sentential structure, and paragraphing.

In comparing these requirements with the English required by the Harvard Dental School you can readily see that in order to pass the English requirements to enter Harvard a student must have studied a much longer time than would be required to pass the English to enter the dental school at either Pennsylvania or Michigan. This is true of all other subjects required for entrance.

I believe that this advance in preliminary requirements is of much more importance to the profession than the addition of a fourth year to the course, and that it will lead to still higher requirements, finally reaching the degree of arts or of science.

The status of a profession is determined, first, by the amount of training and culture represented in that profession, and second, by the contribution that profession makes to the good of the world. The first condition is essential to the second.

It matters not how many years of study we may add to the present curriculum, we shall never make a body of scientific men, or even wise practitioners, out of immature, improperly trained students. It is as true today as in Paley's time, that "Education comprises every preparation that is made in our youth for the sequel of our lives, and if the education be careless or inefficient, or if it be suspended on account of trivial causes, the sequel of the life concerned can hardly be other than such an imperfect preparation must be expected to produce."

DISCUSSION.

Dr. E. W. PRATT, East Hartford. What I have gathered from listening to the reading of the paper is not preliminary requirements in dental education, but preliminary requirements before beginning the dental education, that is, the preliminary requirement for entrance into college. Of course that does not

insinuate that I am going to disagree with Professor Smith, for if I can find any point in which to disagree with him I think I shall be doing well. You see before you an example of a dentist who never had any preliminary education to speak of—that is to say, if the preliminary requirements in my day had been

on the lines of Professor Smith's paper I should certainly never have been able to get into college with any of the opportunities that I ever had. I do not believe I would have been able to prepare for so thorough an examination as that, because I do not believe it is in me. It is another case of the man behind the gun, as we have seen in the discussion of the filling materials.

We go over the country and see today dentists practicing with eminent success and recognized as successful dental practitioners, who have not only been successful in a financial way but in a social way, and in their home life they are recognized as eminently respectable professional citizens of the community in which they live, and who studied dentistry on the same plan as I did, so far as the preliminary education went. At the same time I want to say that I do not believe any man can be too thoroughly prepared before entrance to the dental school. I believe that all the learning he can get will be to his credit, and to the credit of the profession.

When I went to Philadelphia Dental College I was required to deposit five dollars as matriculation fee and pay the tuition, and was not required to come up to any particular standard of preliminary education. I was permitted to stay there two years, and then I was fortunate enough to be able to pass the requirements of the board. I don't know how much more I knew than anybody else in the class, but I know that I knew a little less when I got out than when I went into college. Not because I was not taught properly, but because my conception of knowledge was larger when I came out than when I went in.

I do not, however, believe in making the preliminary requirements for en-

trance to college too high. So far as the manual training goes, all the preliminary education the student can get in that line will be best for him. We are turning loose on the public today men who are going to be eminent in their profession, whose faulty preliminary education will in no way hinder them from making a success. Some others are being turned loose with high preliminary education who will never make successful dentists. It is simply a question of the man behind the gun. I do not believe in making the preliminary requirements too difficult; teach all you can, but don't cut a man out because he does not know it all before he comes to school. Save something to be taught him after he comes to school.

Dr. A. W. COWEE, Hartford. I am incapable of discussing any of the problems offered, and am certainly not capable of solving any of them. At the same time I take a little hope, and much consolation, in the fact that we have around us so many very marked characters in the dental world whose advantages as regards preliminary education, as well as advantages regarding the gaining of a dental education, were much more limited than those now offered in the public or high schools and in the dental colleges. One of my professors at the University of Pennsylvania was in the habit of impressing the importance of every little operation, and he was an authority in his line. When a high-school graduate came before him for examination he was particularly careful in looking for the student to give evidence of the ability to work things out. In his teachings he was particular in impressing the importance of being able to carry an operation step by step, from the time the operator conceived the necessity of the operation to the time of

the completion of that operation. And that to my mind is one of the very great arguments which would seem to speak against too much preliminary education along certain lines being required. There are men that make a wonderful success along mechanical lines who could never go into a school and master literature and the foreign languages. These same men are capable of taking a subject and working it out step by step, and I believe dentistry as practiced today, whether mechanical or surgical, is more or less of a step-by-step operation.

Dr. G. A. MAXFIELD, Holyoke, Mass. I was glad to hear this paper. I am proud of grand old Harvard and the work she is doing to raise the standard of dentistry. Just think of the possibilities of the men having the benefit of this preliminary education before they enter the dental college; just think what you and I could have done had we had the advantage of such a preliminary education! I am very glad to see it; it is just what I have been wanting to see ever since I graduated from college. How I wish I had had such a training in chemistry before going to college! Every night, for the first week at college, I worked until one and two o'clock trying to understand chemical equations. I could go through with an algebraic equation, but could not understand how to make a chemical equation. With this preliminary training how easy it would have been!

The profession of dentistry is recognized as one of the leading professions, and the members of this profession should have a broad and liberal education—at least enough so that when a professor delivers a lecture the student will be able to follow his line of thought. You would appreciate the necessity of

more education for the dental student if you saw it as I do, in connection with the examining board, where we have men come before us who use such expressions that you can hardly read or make any sense out of them.

Dr. Smith spoke of the fact that many of the colleges now are not living up to the present low requirements. That is very evident, and why they do not I cannot understand. These students may educate themselves after they get into the profession, but the probabilities are against it. The times have changed; the requirements of the times of twenty years ago were not what they are today. The requirements in all lines are greater. Dr. Smith says that Harvard will require manipulative ability with the preliminary requirements as well as other ability, and I think this is as important to be recognized as anything else in the profession of dentistry.

Dr. H. S. SUTPHEN, Newark, N. J. I have listened with the greatest interest to the paper, and I believe it is along the right lines. I have always firmly believed in the high preliminary standard for dentistry. I think the one weak point made by the commissioner, Dr. Pratt, was in not advocating a high standard. He said, Allow the student to go in, and if he be made of the right material he will come out satisfactorily to the profession and to himself. That will work if the selection be well made; otherwise it will not. With the low preliminary education required by some of the colleges at the present time, what is the result? The dental parlors are full of men who are almost universally graduates of dental colleges that are deficient in preliminary educational and therefore ethical requirements. The reason these men go into dental parlors is because

their ethical sense is not educated; their sense of justice to themselves and to the profession is not properly cultivated. They look at the commercial side of dentistry rather than the artistic. If they are required to have their minds educated, when they come into the profession they will realize the responsibility that falls upon them; they will realize that they have chosen one of the highest professions, and their ideals will be high. I shall welcome the time when the standard shall be raised higher and higher, until the day comes when the degree of science or letters will be absolutely essential for entrance to the dental college.

Dr. JAS. McMANUS, Hartford. When I learned that the dental course would be increased to four terms I was a little surprised, and I did not like the idea. Four years is a long time to keep a young man in a position where he is not able to support himself—because, as you all well know, a person at college is spending money and not making money. In the matter of preliminary education, while I appreciate all that the essayist has said, and feel that the young man should have a good education, yet I fail to realize the necessity, in order to practice dentistry successfully, of his knowing Latin and French. I don't care how learned a man may be, the minute he loses one of his fingers his learning is of no use to him in dentistry. Dentistry amounts to nothing unless the man uses his fingers successfully, and has ability enough to understand the general principles. I do not think that it requires four years of a very high order of preliminary education for a man to practice dentistry successfully. It is only necessary that he have a fair amount of manipulative skill and a moderate education when he enters a dental college. If that young man has

the disposition to learn dentistry he is going to learn it, and you cannot stop him. The standard which will require that the student should have an education that will fit him for the very highest walks in life before studying dentistry I think is too high. If you take the graduates of the best medical colleges in the country, how many of them make surgeons. I venture to say not ten out of every class of one hundred. Now dentistry is different from medicine, and the requirements should not be as high unless we are working to get accomplished, scientific, theoretical dentists. But the real object of dentistry is to cultivate the manipulative skill, and to be able to do successful filling operations. That is what the world knows, and that is what the world expects of the dentists.

In the profession are a number of scientific men, and we are proud of them, but they are men who, after they received their dental education, went on perfecting themselves. Look at the profession of dentistry as it is practiced today. Two-thirds of the best operators, when they have laboratory work to do, send it to a mechanical laboratory; they do not do it themselves. Now, there is nothing to prevent a man from becoming a stomatologist, or oral surgeon, or one very skilful in the treatment of the diseases of the mouth; there are one or two of these men in every community, but most of the people want and expect from the dentist the ability to properly fill and treat teeth and make artificial dentures, and that does not require that the young man shall have such a high education before he enters the dental college. This is all well and good if you are going to try to make dentistry a science and all dentists highly scientific men; but you never can do that.

I do not object to men having a high education. I wish I had more, but the main thing is that when a man enters college he should have a fair amount of English education and a fair degree of manipulative skill, and where the colleges are doing wrong is in their allowing the student to continue after his first year unless they know he has that necessary manual ability. I do not think that there is a music-teacher in the country who would take a child and ask his parents to spend money on this child the second year if he did not have a proper ear for tone, melody, and time. It should be the same with the colleges. After the first year the professors should know whether the student has the natural ability to become a fair dentist, and if he has not they should not allow him to continue his studies and after graduating him have the state boards turn him down. Understand that I would like to see all the young men entering dentistry have a good education, but I do not believe in the high standard that is by some considered as a necessity.

Dr. A. J. FLANAGAN, Springfield, Mass. I cannot resist the opportunity to talk on preliminary education, for one reason especially. Two years ago, at Niagara Falls, I had the temerity to read a paper on preliminary education, and I was so hammered on that occasion that I am glad to see some of my friends in trouble. Dr. Smith differs in his paper from two of the greatest minds on education that this world has ever produced—Froebel and Herbert Spencer. Last night I spoke of aristocracy in the dental profession, also democracy. Now, in considering the question of education in the present day we must eliminate one country from all others, and that country is America. We can take all countries,

especially the older countries, on one side and put America on the other, and America in many ways will overbalance the older countries. It is common knowledge that in the older countries education was for the wealthy—was practically established for the aristocrats. It was formerly something few could have. If a man happened to be a hewer of wood and a carrier of water, he could never be anything else. If a young man was unfortunate and had for his father a baker, he could only hope to be a baker himself; he could not hope to be a physician or a dentist. But come to America, and what do you find at the present day? We find that it is the man that does something, that gives to the world practical results, who is highly honored. That being the case, the preliminary educational requirements will differ.

I will admit that Dr. Smith's arguments apply to the foreign institutions. He has taken the ground that we require higher education from the standpoint of the scientific, and not from the practical. Now, the statement is made in regard to mechanical training that the greatest development of the mind comes from the training of the mind and the fingers together—they must go hand in hand. If there be any one weakness in our system of dental education greater than another it is that we do not differentiate in the beginning between the man who is mechanically deficient and the man who is mechanically perfect. Would you, for instance, attempt to make a musician of a man who has no conception of tone? That man can never be a musician, and why? Because his ears are imperfect. Can a man be a surgeon who lacks brains in his fingers? I think we can safely say No to that proposition. I think we will have to have some preliminary educa-

tional requirements that will bring out the fittest men for a career in dentistry. That is the weakness in our preliminary educational requirements, and that is a thing we must deal with in the future. Dr. Smith has made the statement that we do not require the degree of letters, but that we require living up to the present laws. He has repeatedly stated that the standard of high-school education differs. It is a very elastic thing. The high-school education constituting two years in Massachusetts is far higher than any high-school education, and equal to some college educations south of Mason and Dixon's line. Therefore the New England standard of education is not the Southern states' standard. That being the case, why is it that men up in New England, when they have not the sufficient preliminary educational qualifications, will go many miles to Southern colleges. The reason is this—that these colleges are members of the College Faculties Association. They have given their word that they are going to live up to the requirements made by that association. What are these requirements? The requirements are so elastic that the very professors of these colleges will allow a man to enter without examination—and that statement I am willing to back up, and prove it. This man enters the college and passes the requirements for the first year, and according to the Faculties Association rules and regulations there is nothing to prevent his going the next year to a higher college—that is, a college requiring higher qualifications for entrance. There is something rotten in Denmark, gentlemen, when that state of affairs exists. We do not need more laws; we need to cultivate the principles of justice, the principles of character and manhood.

Give me a man that has the principles of manhood, and I do not care what his preliminary qualifications have been—that man can rise to positions of honor in this world. Dr. Smith, it seems, judges the profession from the standpoint of culture. I disagree with him there. If I understand the English language, and understand the meaning of the word culture, it is this—that culture is pre-eminently the process of refining the moral and intellectual nature of man. You will understand that the moral nature comes first. Is there any greater first requirement in our profession?

Dr. R. M. CHASE, Bethel, Vt. It has been my good fortune to be a member of the State Board of Examiners for the past twenty years, and I have not seen a year but what the preliminary educational qualification of the students grew better. It is increasing every year; they are coming to us better educated men. There is hardly a town in Vermont but has a high school, and it seems to me if we are going to demand four years of time for the student in college he had better take up the medical line. Let him go to a medical school and graduate, and then, if he has the manipulative dexterity, let him take up dentistry as a specialty. The high schools in our towns are making it possible for the boys to be better educated than they have been, or were twenty years ago, hence they come to us better equipped to practice dentistry, and it seems to me that the young men are keeping pacc with every professional calling.

Dr. SMITH (closing the discussion). It is all very well to speak in general terms about the man behind the gun. Of course that is what we want, and it is simply another way of expressing that we want better men. Dr. Flanagan

speaks of aristocracy in dental education. If there is to be in America an aristocracy, it seems to me that an aristocracy of education is the proper kind. An aristocracy open to everybody. We will not allow a man without a dental education to have the dental degree; there is one kind of an aristocracy! I do not believe for a moment that a man can be over-educated in the right direction. With our present system of education, with the elective courses and the manual training schools, we are bringing out a class of young men who are educated to use their fingers, and that is just as much a training of the mind as Latin or Greek.

When we talk on the question of educational advancement, many men who have not had the advantages of this advancement feel sensitive, and they speak from that standpoint. These men seem to forget that in their own study and in their work they are in a large sense educated men. Why? Because they have come to understand life, books, etc., and their power of observation is keen and far-reaching. They have educated themselves. These men should not feel sensitive. It is not what we are today, or what we have done to attain to the point we have reached today; it is what we want for the future. Now, as an educator, connected with a school, I am in touch with the problem, and I should feel that I had neglected my duty if I did not use my influence for a higher standard of dental education. I want to leave the educational standard higher than where I found it.

Another point: As a profession we seem to be losing sight of the educational scientific side, but seem to revolve around the mechanical idea. I am not a man who underestimates the value of mechan-

ical training, finger skill, but there is something else besides finger skill. Is not the profession suffering from the lack of properly educated men along scientific lines; men who can deal with dental subjects from the scientific standpoint. We find cavities, and fill them with gold, but should we not know more about the causes. Should we not know more about pyorrhea and its causes? Are we fit as a body to deal with these problems? I say we are not. I claim that the majority of the dental students today cannot understand a scientific study from a scientific teacher, and I think it is time to make a change in that direction. The only way to do it is to require a better educational training to start with. It is simply looking to the future—and, gentlemen, it is sure to come.

One point more with regard to Dr. McManus' statement that it makes no difference what education a man has, if he loses a finger he is out of the game. Now, I am afraid he has a circumscribed idea of dentistry. Don't you suppose that if Dr. McManus, with his training—and he has been a student all his life and is an educated man, whether he is self-educated or not I do not know—don't you believe that if Dr. McManus should lose his hand he could sit right in his office and always prove a wonderful help and benefit to his patients, if only in the capacity of consulting dentist. We are educating our students to do beautiful bridge work and make beautiful fillings. But how important it is that these students should have the judgment to know where to make the proper application of that bridge and that filling.

The subject was passed, and a motion to adjourn until 8 o'clock was made and carried.

TUESDAY—Evening Session.

The third session was called to order Tuesday evening at 8 o'clock by the President.

The first subject on the program was the reading of a paper by Dr. S. H. GUILFORD, Philadelphia, entitled "The Obligation of the Professor to the Colleges," as follows:

THE OBLIGATION OF THE PROFESSION TO THE COLLEGES.

By S. H. GUILFORD, D.D.S., Philadelphia, Pa.

HALF a century ago, when dental colleges were new and few, the profession took an especial interest and pride in her institutions of learning. This was but natural and proper, for the two stood in the relation of parent and children. The schools were the logical result of the need and desire of the profession.

The great body of dental practitioners were intensely interested in their offspring, and gave freely of their time and labor to further the cause of dental education. This indeed was necessary, for with the great expense of establishing, equipping, and conducting the schools, and the small number of students, there was but a meager margin left to compensate the teachers for their labor. The schools were newly born and needed this assistance in order that they might attain to the full measure of their development. There existed a pride also in this new branching out of the profession, emphasized in no inconsiderable degree by the rejection of the overtures made for the inclusion of a dental curriculum in medical schools.

For many years those who accepted chairs in the institutions not only labored without recompense, but in many

instances contributed from their private funds for the carrying on of the schools. In time, however, with the increase in the number of students, the institutions became self-supporting and were able to stand alone.

As new schools multiplied, and the older ones grew in strength and efficiency, public professional interest continued to be manifested in them, though perhaps in a less degree than in the first flush of pride at their origin. Later, when the number of new schools increased to an extent which to the profession at large seemed unwarranted, interest in them began to wane. This was due to several reasons:

First, it was believed that the organization of many of the schools was due to the desire upon the part of the originators to reap the honors incidental to the holding of professorial chairs.

Second, inasmuch as many of the schools had prospered to an extent that enabled them to pay fair salaries to the instructors, it was felt that many sought positions for the revenue to be derived from them.

Third, in the constant large accessions to the student body, and the increased

number of graduates turned out, many saw or thought they saw a menace to their own practices through greater competition. Many there were who sincerely believed that the output of the colleges was greatly in excess of the public need, and that it should be checked if possible. There were others who felt that the material taken into the colleges in the way of new students was of an inferior character intellectually and that some barrier should be erected to prevent this.

As a consequence, dental laws were passed and examining boards created whose duty it was to sift the material both entering and leaving the schools, so that incompetence of every sort might be eliminated and a higher grade of professional men be given to the public.

About this same period the schools themselves recognized that there was a lack of harmony in the conduct of their institutions; in the methods of teaching; in the length and number of their terms, and in the standards of efficiency. To remedy these defects, and to elevate the educational plane, the National Association of Dental Faculties was organized.

Some years later the examining boards of the various states formed themselves into an organization known as the National Association of Dental Examiners. The laudable object of this association was to harmonize, as far as possible, the different state laws; to standardize their methods of examining applicants for licensure, and to have an oversight of the colleges both in the matter of their equipment and their methods of teaching, so that those entering the profession through the colleges should be most fully equipped for serving the public efficiently.

The two bodies named were different in character, but essentially one in pur-

pose. Both labored earnestly, and each bore good fruit; but as there was some difference in their methods, one being a chartered body and the other only a mutual association, and as each viewed the matter of educational advancement from a somewhat different standpoint, it was perhaps only natural that they should at times come into conflict in endeavoring to carry out their individual purposes. The colleges believed that they were making changes and instituting reforms as rapidly as the existing conditions warranted, but the examiners felt that the changes were not rapid enough, nor in some cases radical enough, to subserve the best interests of the profession. In these contentions the examiners were largely upheld by the lay practitioners, who for reasons already stated thought that greater restrictions should be placed upon the colleges.

Fortunately, the differences which arose between the two bodies from time to time were gradually adjusted; during their continuance, however, the members of the profession relaxed somewhat in their loyalty to the schools. For the time they seemed to forget the importance of the work being done by the schools, and kept in mind only certain shortcomings which they believed to exist. This was unfortunate, for the schools needed the full sympathy and support of the profession, without which their work would be greatly impeded, or at least rendered less valuable in character. While this unsympathetic feeling on the part of the profession toward the colleges was not by any means universal, and while a large majority nobly stood by the colleges, believing that they were working out the problem of dental education in the most effective manner, the teachers themselves felt that they were

not receiving the full support they had once enjoyed.

My plea today is for a better understanding between those within and those without the colleges. To accomplish this I think it only necessary to bring to the attention of the profession some of the difficulties the teacher encounters in his work; the time and attention he devotes to it; the many outside demands upon his strength, and last and most important of all, the principles which actuate him in the effort to fulfill his mission.

Time was, when the duties of one who held a professorial chair in a dental college were comparatively light. The course was short, the subjects few, and the requirements very meager. The average material that came in the way of students was intellectually low and mechanically high. Hard study was not required to cover the didactic portion of the course, and as most of the students possessed considerable manipulative skill acquired in their preceptors' offices, it required very little effort to advance them along this line.

Since then, with the immense expansion of the entire course, the didactic portion has grown more rapidly than the manipulative, and to take such students as have not had a very thorough preliminary mental training, and drill into them a good comprehension of some of the more difficult subjects taught, requires more time, patience, and labor than most practitioners are aware of. Even with the expenditure of these, one of the greatest difficulties the teacher has to contend with is that of bringing the duller members of his classes up to near the level of the brighter ones. The mental strain of this effort is far greater than the mere physical labor connected with his ordinary duties.

But perhaps in no way is the contrast between the duties of the teacher of twenty years ago and the one of today more noticeable than in the amount of time he is now obliged to give to his work. If lecturing were the only part of the teacher's labor, as it once was, it would indeed be easy, but with the addition of new subjects to the curriculum new laboratories have had to be established, and the proper care and oversight of these have added immensely to the teacher's responsibility. In addition to the old-time laboratories of chemistry and prosthetic dentistry, which at best needed the supervision of but two members of a faculty, we now have those of physiology, histology, and bacteriology, while the subjects of operative and prosthetic dentistry have been so enlarged by the inclusion of the numerous subjects as to require several additional laboratories for their elucidation. Thus each member of the faculty has come to have one or more laboratories under his care, for the proper conduct of which he is responsible.

With this enlarged scope of work comes the necessity for carefully examining and rating the work of each individual student, approving that which is good, rejecting that which is inferior, and endeavoring to bring all to a common plane of excellence. This cannot be done properly by the demonstrators in charge, but must be attended to by the incumbent of the chair. This labor alone consumes numberless hours of the teacher's time.

But the time which the instructor devotes to his work in the college building does not comprise all that he is called upon to give. His very position makes him a shining mark for the executive and clinic committees of numerous local,

state, and national societies, and he is also kept prominently in mind by the editors of magazines and the writers of books. To many of these calls he must respond, for he regards it as a duty he owes to the profession; while in others he cannot well refuse the pleadings of those who once sat under his instruction.

To all these demands upon his spare hours should be added another, that of replying to letters from alumni, asking advice in difficult cases. Compliance with any of these requests is a pleasure rather than a tax, but taken in the aggregate they constitute a sweeping demand upon his evening hours which he would otherwise gladly devote to home enjoyment, reading, or necessary rest. It will thus seem that he pays most liberally for the honor of being a college professor. Still, with it all, if he be of the real type, he enjoys his work and would not have it otherwise.

While no doubt there are exceptions, we believe that as a rule the teachers in our dental schools are, in a sense, born to their work. If they were not qualified they would not be chosen, and if they did not possess a real love for teaching they would not assume its labors and responsibilities, or make the sacrifices which are involved. Like teachers in other departments of human effort, they accept their calling and put forth their best efforts with the hope of obtaining the best results; they realize the almost sacred character of their obligation, and propose to be true to their trust. All they ask in return is that they shall receive due encouragement from the profession, whose servants they are.

If, then, the teacher realizes his many obligations and earnestly strives to fulfill them, what help has he a right to expect from the profession in general?

There are many ways in which practitioners can render efficient aid to the colleges. They can visit them frequently, offer friendly criticism when necessary, and give generous praise for all that they consider worthy of it. By their presence at the social functions and students' meetings they can show that their interest in college affairs is still maintained. Probably nothing so greatly stimulates both students and teachers as to notice that the alumni have not allowed their affection for their alma mater to wane with the reception of their degrees. Alumni associations, both local and general, may be made most profitable to colleges and alumni alike if they are well organized and managed, and if the attendance at their meetings is sufficiently large to awaken the enthusiasm which numbers help to create.

In a far larger measure, however, they can render efficient aid to the colleges by seeing that the best possible laws are enacted, by taking an active interest in the selection of the members of the examining boards, and by creating a sentiment in favor of such measures as will tend to bring about uniformity in the examination of graduates for licensure and interstate comity in the acceptance of licenses to practice.

While it is (or should be) public professional sentiment which determines the advisability of the establishment of dental schools, the profession at large does not have any active part in their organization. They do not elect the trustees or the teaching faculty, and have no part in the management.

With the laws and the state boards, however, it is different. The profession, through their state societies, have the selection of the members of the board, and also have the framing and amend-

ment of laws in their own hands. If even half of the practitioners in each state were members of its state society and took an active interest in its proceedings, including the selection of the state examiners and the framing of necessary legislation, they would render a large and important service to the public, the colleges, and the incoming licentiates.

Thus far, with only a meager representation in the state society to attend to these important duties, all has gone remarkably well, but it may not always be so. State laws and their enforcement by the state boards are affairs too far-reaching in their results to be left to a comparatively few men. Even with the laws as they now exist, much discretionary power is vested in the dental boards. Their members, I am sure, would be glad to have the active co-operation of thoughtful and earnest practitioners in helping them to decide on certain details of procedure. They realize that they are the servants of the profession, and are only too desirous of doing that which the profession at large deems best.

Uniformity of the examinations in the various states is a matter of the utmost importance, toward the accomplishment of which each practitioner could in his way lend aid. In some states quite a proportion of graduates fail to pass the state examination, at least at the first trial, while in others students at the close of their first or second year find no difficulty in passing. This matter calls loudly for correction, and public senti-

ment, if forcibly expressed, would bring about a change.

As to exchange of licenses between states, probably nothing need now be said, for the various boards recognize its necessity and are doing all in their power to bring it about. In this they are well supported by the profession.

One other innovation needs to be introduced by the boards, namely, the division of the examination so that certain branches can be passed off at the close of the second collegiate year, and the balance after graduation. Four years is too long a time for a student to carry all of his studies and keep sufficiently fresh in them to pass a creditable examination in each. With the examination divided the same end would be accomplished, and the student be relieved of an enormous strain. A slight amendment to existing laws, where necessary, could easily bring this about if the profession would but awake to its necessity. This is a matter that deeply interests both the teachers and the students in our colleges.

The examining boards have done, and are doing, excellent work both for the public and the colleges, and they stand ready to do even better whenever a healthy public sentiment inspires them to do so.

Let us hope, then, that in the future, with the profession recognizing its obligation to the colleges and the colleges understanding their duty to the profession, a spirit of perfect sympathy may prevail and the true ends of dental education be subserved.

DISCUSSION.

Dr. G. A. MAXFIELD, Holyoke, Mass. I feel highly honored by being asked to discuss this paper of Prof. Guilford's, especially from the fact that there is no man in the profession for whom I have a higher regard and respect than Dr. Guilford. I shall never forget the help he was to me just after my graduation from the University of Pennsylvania. That was about the time he was first connected as a professor with the Philadelphia Dental College. I will always be grateful for the kindly sympathy he showed from the time I first met him. When I met with dental troubles, and I had many in those days, he was always ready to listen and advise. I enjoyed listening to the paper, but wish someone else had been selected to open the discussion, so I could have had more time in which to formulate my ideas.

He says that the dental profession is not in proper sympathy with the dental colleges. There has been much criticism of the colleges in the last ten years, with more or less reason, and as the colleges have been stimulated by this criticism to a better teaching and equipment, so the attitude of the profession is changing toward them. There are still many dentists who never attended a dental college, and there are a great many who are not members of dental societies. Why this is so I cannot explain. There are over two thousand dentists in my state, and a membership of only about four hundred in the state society. As a rule, you will find that a large majority of those who never attended a dental college are not members of any dental society. Then there are many who have gone out from

the dental colleges with such low ideals that they at once commence advertising.

It discourages me when I meet certain dentists, graduates of dental colleges, who think all it is necessary to know is how to put in a gold filling, in order to be recognized as a member of the dental profession. The dental colleges stand right, and according to the times were right for many years. Then some of the colleges deteriorated, and other poor colleges started.

The essayist referred to the idea that many thought the pecuniary interest was the reason for the existence of so many colleges. A few years ago—I think it was the year before Dr. Abbott died—there was a disagreement among the trustees of the New York Dental College, and they gave out some interesting facts in regard to the condition of their affairs. Among those developments was the fact that, that year, they had divided forty-five thousand dollars among five professors. This report of the trustees was published in the *New York Tribune* and there was much criticism regarding it. Was not this a sufficient proof that this college was run as a money-making scheme? I do not know how many other colleges had been run in like manner, but it was commonly reported that there were others.

Another ground for criticism was the low standard of the entrance examination to many of the colleges. From my own city within the past five years a number of young men who have not even been through the grammar school have entered some of the dental colleges. Now, what kind of dentists will these

young men make? Some of them may have ambition enough to amount to something, but the probabilities are that they will make poor dentists, and will drift into the dental parlors and become fakirs.

Dr. Guilford alluded to the National Association of Dental Examiners and their antagonism toward the dental colleges. There were several reasons for this. In some states the boards register the candidates on presentation of their diplomas. When the N. A. D. E. was organized the standard of entrance to many of the colleges was very low, and the association realized that there must be a change regarding this, also that the teaching force and equipment must be at a certain standard. Now, many members of the boards were recent appointments, and like many others who suddenly have power thrust upon them were inclined to be too arbitrary in their dealings with the Faculties Association; but wiser counsels have prevailed, and I think now that that feeling of antagonism has almost wholly passed away. The dental examiners now realize that their work is entirely different from that of the educators. While there were many things about the colleges the Examiners Association wanted to correct, the great trouble I think was trying to accomplish their end too quickly. History shows that progress is slow, and these reforms cannot be accomplished at once. Compare the dental colleges of twenty years ago with those of today, and see what great advances have been made and what they now are required to teach. When I graduated twenty-four years ago, little was known of the science of bacteriology—in fact, almost the whole science has been developed within the last twenty years.

In regard to the criticism of the examining boards, we want to remember that all appointments to such boards are political appointments. In some states the dental law allows the state dental society to control these appointments, and in that way they are taken out of the hands of the politicians. This cannot be done in all states, for politicians are very jealous of any infringement of their rights and will not allow the influence that such appointments give to be taken from them. I know of one state where the governor recently, in making certain appointments to the examining board, gave as his reason that he thought they would assist him in his political ambitions for the future. The endeavor, therefore, must be to bring such political influence to bear that good appointments will result.

The examinations as conducted by the boards should be different from those conducted by the colleges, for theirs is a different standard. The colleges in educating the man establish a certain standard of knowledge which they think the student must reach before they grant him his degree. The dental laws are for the protection of the public, and the board examinations should not be to see how much the candidate knows, but whether he is a safe man to practice on the public. Dr. Guilford thinks the examining boards ought to allow the student to come up for examination at the end of his college year, being examined only in those branches which he has just passed in the college; or, where he passes in certain branches and fails in others, the boards should not compel him to take all the branches again at the next examination. Now this plan would not do at all. The boards are examining the candidate to see if he be fit to practice at the time

of his examination, not to see how much he knows or how much he may know in certain branches at any stage of his college career, but, Is he fit to practice now? If he pass, say, in anatomy and philosophy and fail in the other branches, how much will he know of the first two when he finally passes in the others?

Some years ago the Massachusetts board passed a man in whose case they were severely criticized. He had been a clerk in a dental depot, and when he came up passed a fair examination. The question was, How could such a man, who had never worked in a dental office or been to college, pass such an examination? Upon investigation it was ascertained that he had for a few years interviewed as many of the candidates as he could and had kept a memorandum of all the questions they could remember, and it was after cramming upon those questions that he passed the board. A few months later he tried the Vermont board and made a bad failure. The reason for this was that after he had passed the Massachusetts board his incentive to study was gone, and the results of the cramming process passed rapidly out of his mind, and when he took the Vermont board he did not know enough to pass it.

In Massachusetts we have divided the examination into two parts, theoretical and practical, the latter being work done in the mouth of a patient before the board. Now, if a candidate pass his practical part but not the theoretical at an examination, he will not be required to operate at the next examination; or, if he passes his theory and not his operation, he will not be required to take theory at the next examination; but if this runs on over a few examinations, then he must take the whole examination

again. With regard to uniformity of examinations, the different boards of the New England states have formed an association and have practically, with one exception, arranged a uniform examination, but it will be many years before this can be accomplished in all the states.

A great deal has been written and also discussed at many dental meetings regarding a uniform dental law for the different states. While we are working for this, I doubt if we ever accomplish it. Just think for a moment of the diversity of the laws of the different states regarding marriage and divorce. Here is a great moral question which involves the stability of the family—which is the very foundation of our government—and yet it is impossible to get the different states to pass a uniform law. If it cannot be accomplished where it involves such a vital question as marriage and divorce, how can we expect very much in regard to dental laws? In regard to the latter we cannot go any farther than public sentiment will support us. There is not a man on the examining boards who has any ambition and has the interest of his profession at heart but what would like to see the candidates that come before him have a better preparation. The examining boards would like to make the examinations more rigid, and we can do this only as public sentiment is educated up to it. How many people are there all over this country who still have the idea that the dentist simply extracts teeth or fills them with gold. I have just been informed that in one of the papers published in this city this evening the article on this meeting is headed "Where the Tooth-pullers Meet." If there is anything that hurts my pride it is such slurs as this in the public press.

I have not said as much with regard to

the dental colleges as I should have liked. Where would the dental profession be today if it were not for the colleges? They deserve and should have our support, but honest criticism cannot do harm and should not create antagonism. I do not condemn all the colleges, but I do say that if a student attending one of the poorest of the dental colleges is inclined to study and will take advantage of the opportunities there given, he will become a worthy and honorable member of the dental profession.

Dr. GUILFORD (closing the discussion). I may allude in a very few words to what has been said in regard to the examining boards. It was stated that there was some clashing between the colleges and the examining boards in the early days of the organization of the Examiners Association. There are some things not generally known in regard to the troubles in those days, and one is that some of the more imprudent members of the Examiners Association made remarks that were unkind and unfortunate. Not many years ago a member of the National Association of Dental Examiners, chairman of one of the most important committees, made the remark that he had labored for years and had at last succeeded in getting the colleges under his thumb. These things, however, have

passed away, and I think there is much more harmony than at one time existed.

Another point I would like to refer to; it is in regard to the matter of compensation for college work. Many have the idea that the compensation of professors in colleges is the main incentive to teaching. Such is very far from the truth. There may have been years when some of the colleges have paid large salaries to their instructors, but there have been more years when that has not been the case. If any one wishes to realize the money return from connection with a dental school let him be dean for a while. No man can do his duty in that position without sacrificing more in his private practice than he ever gets return for. That point was in mind when I said that unless the teacher had the love of teaching implanted in him he would not undertake the work. I do not believe that men go into college work for the money they get out of it. It is an obligation which the teacher assumes for the love of the work, and he is impelled by a sense of duty to his profession.

Dr. Guilford's paper was passed, and Mr. F. LEROY SATTERLEE, JR., A.M., New York, read a paper entitled "Recent Applications of the Tri-Ultra-Violet or X Ray to Dental Surgery," as follows:

RECENT APPLICATIONS OF THE TRI-ULTRA-VIOLET OR X RAY TO DENTAL SURGERY.

By FRANCIS LE ROY SATTERLEE, Jr., A.M.,

DIRECTOR OF PHYSICAL AND X-RAY LABORATORIES, NEW YORK COLLEGE OF DENTISTRY.

BEFORE proceeding with the demonstrations this evening, we will give a short time to the theory, history, and development of the Roentgen ray and its kindred radiations. I have therefore divided my subject into three headings, namely, *theory*, *apparatus*, and *applications*.

The early experiments with vacuum tubes proved but little of importance beyond the fact that any rarefied gas, when subjected to an electrical discharge, gave forth a peculiar light or phosphorescence. Air produced a pale violet glow, hydrogen a red, and carbon dioxide a steel coloration.

Sir William Crookes in 1878 constructed the first form of focus tube ever used. He experimented with the rectilinear rays within the vacuum bulb and by introducing a curved negative electrode, or cathode, succeeded in projecting these rays to a common point. Objects placed at the focus of these rays were heated to whiteness by the "bombardment" of the enormous quantity of projected molecules.

All such rays produced in a partial vacuum, when excited by an electrical

discharge, were termed "cathode rays," from the fact that they originated from the negative terminal of the vacuum tube, and it was discovered that there was evidence of these rays outside of the vacuum tube, and that they even penetrated a thin sheet of aluminum. This was in 1883, twelve years before the discovery of the X rays.

Professor Weidemann of Leipzig was the first to ascribe to these "cathode rays" the possibility that they were in reality light rays of extremely short wave-length situated at the remote end of the regular light spectrum. This theory was gradually conceded by the physicists till at length the name cathode rays gave way to the ultra-violet and ultra-ultra-violet rays of the present day.

It remained for Prof. William Courad Roentgen, after a long period of dormancy on the part of the experimenting scientists, to again startle the world with the announcement that he had discovered an entirely new ray differing from any of the cathode rays, inasmuch as his rays not only passed through a thin sheet of aluminum, but that they penetrated the human body, and many other opaque sub-

stances, and disclosed upon a screen coated with a layer of bariuin-platinocyanid a perfect shadowgraph of the bones, or other intervening substances of different densities. This was in December 1895, and it was but a few months later that Dr. Roentgen found that the rays had an active influence on a photographic plate.

You may all recall with what wonder and surprise you looked upon the first radiographs printed in the newspapers in the winter of 1896. These rays at once became known as the "X rays," called so by their modest discoverer, who preferred to designate them by the algebraic unknown quantity than by his own name. X rays they have been called, and X rays they will remain, try as we like to dignify them with more accurate titles.

Dr. Roentgen, in a paper read before the Wurzburg Physico-Medical Society, described some of his experiments, and the facts that he deduced from them. Among other things he showed that the rays had a penetrating power that was governed not by the thickness but by the density of the substance. He also formulated a theory that they were perhaps due to the longitudinal vibrations of the ether.

Since that time there have been many investigators in the field, the results of whose experiments have been published in every scientific journal all over the world, and it is unnecessary for me to follow up this evening, even if time permitted, the many hypotheses and conclusions brought forward regarding the exact nature and cause of the Roentgen radiations; suffice it to say that the old theory of Professor Weidemann's in reference to the cathode rays was again brought into use, and the present classi-

fication of the Roentgen rays places them at a point in the spectrum below the ultra and bi-ultra-violet radiations.

We find at the very lower end of the spectrum the tri-ultra-violet or Roentgen rays, with an estimated wave length of 0.014 micron; above this come the bi-ultra-violet rays, of about 0.1 micron in length, consisting of those rays given off by such radio-active substances as radium, uranium salts, polonium, and in fact all the Becquerel rays. In this class also belong those of the cathode rays that will pass through glass. The next step is the ultra-violet rays of 0.21 micron in wave length, and the majority of the cathode rays that have not the power to penetrate even glass. Next come the violet, indigo, blue, green, yellow, orange, and red rays with the respective wave length. Still above these come the ultra and bi-ultra red or heat rays, and at the top, beyond a gap that we have not been able to classify at present, and as shown by the difference in wave length of the two classes of rays, come the tri-ultra-red or Hertzian rays now used for wireless telegraphy.

APPARATUS USED FOR THE PRODUCTION OF THE X RAYS AND BI-ULTRA-VIOLET RAYS.

Although the static machine is still used by some as the generating source of electricity, we find that operators are now resorting to the induction coil for their electrical energy. We have here tonight for our demonstrations a coil that has been especially constructed for X-ray work. This coil, when used in connection with an interrupter of the electrolytic order, will generate X rays of a quality and intensity that have never before been equalled, thus not only giving a

better radiograph, but diminishing the time of exposure to a minimum.

At many meetings of different dental societies where the X ray has been under discussion the subject of prices of outfits has come up, with the fact of the apparatus having been so costly as to be beyond the reach of the ordinary dental practitioner. For the benefit of those of you who have either partaken in these discussions or have read of them, I would like to say that in this coil we have a combination *par excellence*, and economy that would recommend it to those whose means were either great or small.

Besides a coil and interrupter we must have a suitable rheostat, a fluoroscope, and a supply of vacuum tubes, the last-named requisite being perhaps the most essential for good work—for unless the operator has a good tube his results are sure to be of a discouraging nature.

We will give a few minutes to the description of an X-ray vacuum tube. It consists of a bulb of glass with two elongations into which are introduced, respectively, a positive and a negative electrode. The tube is then exhausted of air to about the 1/1000 of an atmosphere. The tube is then connected to the coil terminals by means of two wires from its electrodes. The induced current of about 250,000 volts, and from 8 to 30 ampères, enters through the negative or cathode electrode, and in passing through the tube generates cathode rays. These rays are focused upon a point on the platinum anode, as the cathode is concaved, and are then reflected outward in all directions, since the anode is placed at an angle of forty-five degrees.

When the cathode rays strike the surface of the platinum anode, some of them are broken up into X rays, which are then sent out in all directions from the

anodic surface, producing a hemisphere of activity whose radii all point to a common center upon the positive electrode.

There are many kinds of tubes, but my time this evening being limited, and as I wish to get to the demonstrations and lantern slides which I know will be of more interest to you, I will confine myself to a few of the characteristics of X-ray tubes.

You all know that it is impossible to pass a current of electricity through a vacuum, and it therefore follows that the higher the vacuum the harder it is for the current to pass through the tube.

It is also true that a current of electricity passing through a vacuum tube has a great tendency to raise that vacuum. This being so, it presents to us one of the greatest problems in X-ray work, and our only success has been with tubes having some mechanical contrivance to lower the vacuum.

APPLICATION OF THE ROENTGEN RAY AND ITS KINDRED RADIATIONS.

When the X rays first began to be used, physicians and other operators became much alarmed at what appeared to be an inflammation of the skin following a prolonged exposure to these rays. It was at first supposed that this dermatitis resembled a burn, and its cause was attributed to the electricity given off by the operating tube.

This theory was for some time believed to be correct, and from it the term "X-ray burn" originated, and it was not until Dr. Kienbock of Vienna had conducted a long series of experiments, details of which I will omit this evening, that the conclusion was reached that it was not the electricity but the X rays

themselves that were the cause of all the mischief, and furthermore that those rays given off by a low-vacuum tube were more dangerous than those given off by a high-vacuum tube, although the latter gave off far more electricity than the former.

Many experiments have been made to prevent this development of dermatitis, but with no results where the patient had been under the ray for a length of time. However, with the improved apparatus now in use, we rarely if ever hear of a case of burn, since the length of exposure has been reduced to a minimum. It takes us now but a minute and a few seconds to take a picture through the most difficult part of the body, while radiographs of the arms, feet, and teeth are made in a few seconds, where formerly twenty or thirty minutes were given. It is obvious, therefore, to you, when I tell you that no case of burn has ever been reported that has been caused by an exposure of less than twenty minutes, that there is far more danger to the operator than to the patient; but even so, with moderate care in refraining from unnecessary exposure to the rays, the operator is perfectly safe from anything more than a slight reddening of the hands. Today, where a patient becomes burned, it is caused only by gross negligence on the part of the operator, unless of course the rays are being used as a therapeutic agent, in which case it may be necessary to produce a burn in order to cure the more serious lesion.

The applications of the X rays have been discussed so often in the journals, and even in the newspapers, that to dwell on the general uses of the Roentgen rays would but waste your time and mine. I will therefore confine myself to presenting the results of the use of the rays

from a diagnostic point of view, as will be shown by radiographs we will soon project upon the screen [some of which are here reproduced—see Figs. 1, 2, 3, 4, 5], and to the most recent application of X-ray science in dentistry, namely the treatment of pyorrhea alveolaris by means of the Roentgen rays, the bi-ultra-violet rays, and high-frequency currents.

Up to a very recent time radio-therapeutics was considered to be of no practical value to the dentist, but now there are indications that seem most promising to the dental practitioner. In the *Cosmos* of December 1903 there appeared an article by Dr. Chas. H. Parker of Chicago, on the treatment of pyorrhea alveolaris by means of the X ray and high-frequency currents. In this paper Dr. Parker claims great results, but states that he had found that the X ray alone would not cure pyorrhea.

His treatment consisted in giving the X ray alone for about two minutes, then following it up by high-frequency currents from a large electrode placed over the patient's mouth. He first used a spray of aconite, iodine, myrrh, and wintergreen. This mixture, he says, is carried into the gums and tissues by the high-frequency current.

At the college we gave this treatment many trials with good success, but found that there were ways of improvement.

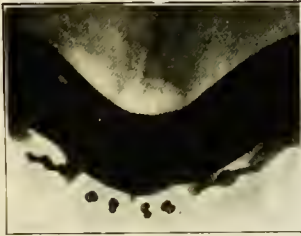
After much experimenting, I devised a vacuum electrode that can be placed directly in the patient's mouth in contact with the gums over the diseased teeth, and another electrode to be held in the hand, thus getting a circuit of the high-frequency currents through the body, actually setting up cataphoric action and at the same time bathing the gums in the rich radiations of the bi-ultra-violet ray.

A solution of adrenalin chlorid is used in place of the iodine mixture. The purpose of this solution is to blanch the tissue, both on the surface and internally, in order that the bi-ultra-violet ray may not be impeded in its passage

REMARKS ON THE ILLUSTRATIONS.

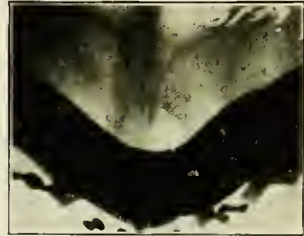
Figs. 1 and 2 are radiographs taken on the platform during the reading of the above paper. As no volunteers among the members of the association presented, the janitor of the hall kindly consented

FIG. 1.



Full upper plate under X ray.

FIG. 2.

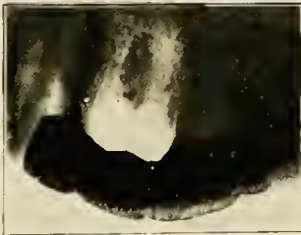


Full upper plate under X ray.

through the tissue. This treatment, in combination with the X ray, has proved very successful in a number of cases, and in the early stage of pyorrhea where the alveolus has not been entirely sloughed away we may claim a complete cure, the

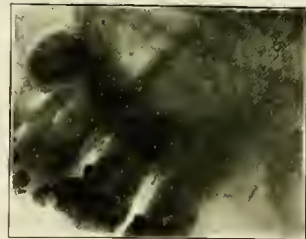
to be a subject. It was not till after taking the pictures that I learned that he had a full upper plate. These pictures are reproduced here since they present to us the curious appearance of a plate under the X ray. The porcelain teeth,

FIG. 3.



Non-extracted root above bridge work.

FIG. 4.



Non-erupted and horizontally impacted tooth.

teeth tightening up, with restoration of the gums to a healthy condition. We hope that the future may continue to prove that at last a cure has been found for this *bête noire* of the dental surgeon.

owing to their lack of density, are hardly to be seen, while the metallic pins show up black in contrast.

Fig. 3 is a radiograph taken of Dr. Youngblood, which shows a non-extracted root above the bridge.

Fig. 4 is taken of Dr. Tenney Barker, and shows an impacted tooth in a position perpendicular to the plane of the normal teeth; in other words, we are looking at what appears to be a cross section of the impacted tooth. The last two radiographs were taken upon the platform directly after the conclusion of the discussion on the paper.

Fig. 5 represents a dental radiograph

the appearance of the normal alveolar process as compared with the regular bone structure under the X rays; but that is only one of the many features that characterize this mode of representation when placed in the hands of the dentist, or even of the dental student.

Can we not say that the practice of dental surgery has made another advance

FIG. 5.



Enlarged negative print of dental radiograph.

enlarged to four times its normal size, and is a negative instead of a positive print, or in other words the color contrasts are reversed, since the teeth show out white instead of black. This is the first time, to my knowledge, that an enlargement (other than a lantern slide) has been made of a dental radiograph. The picture presents a normal condition showing the first and second molars and part of the roots of the first bicuspid and third molar.

I wish particularly to call attention to

and achieved still another triumph, when a magnified pictorial and true representation of almost all pathological conditions of the mouth is to be realized? It is but a question of time when the X ray will stand on as firm a footing in dentistry as the dental engine or other confirmed mechanical necessity; but it will never become as universal, since we must have trained operators to use it, and the average practitioner will not be able to give up his time to the study and practice of the X ray and its methods. It will

therefore be for specialists to develop and to exhibit the wonders of this all-

powerful diagnostic if not therapeutic agent.

After the reading of the paper,

Dr. F. D. WEISSE, New York, made some interesting remarks on the same subject, as follows:

The work that has been presented here tonight by Mr. F. LeRoy Satterlee, Jr., shows the progress made in the laboratory of the New York College of Dentistry, within the last two years, in developing the possibilities of the X ray in dentistry.

Some two years ago (December 1902) I attended a meeting in Chicago of the Institute of Dental Pedagogics, at which Dr. Weston A. Price read a paper on and presented illustrations of X-ray work in its diagnostic advantages in dental and oral surgery. I was struck with the illustrations and their unquestionable advantages to the practicing dental surgeon. I therefore thought that it was the duty of dental educational institutions to develop this work for the more thorough education of the dental student, by adding to the subjective and objective symptoms of dental and oral pathological conditions the objective conditions afforded by X-ray photographs of the teeth and maxillæ.

The New York College of Dentistry upon my suggestion immediately commenced fitting up an X-ray laboratory, and during the rest of the winter of 1902-03 we made some progress. We have since perfected our equipment, and now instruction in X-ray work is established as a part of the education of the student. The laboratory has been under the direction of Mr. F. LeRoy Satterlee,

Jr., A.M., assisted by an expert photographer, and weekly classes, of three students in a section, take X-ray pictures of infirmity cases and do practice work in the mouths of their fellow students. I have followed with much interest the development of the work, and both Mr. Satterlee and myself have gone through an education as to what the X ray will do. All patients of my oral surgery clinic and doubtful conditions in infirmity patients go to the X-ray laboratory for X-ray photographing of their buccal conditions. All these illustrations contribute to our collection for the education of students.

I prophesy that in the near future when a patient comes under the care of a dental practitioner he will require a series of X-ray photographs to be taken of the upper and lower dental arches of the patient, from which positive knowledge of the normal and abnormal conditions of the teeth and alveolar processes may be obtained. These photographs will indicate the immediate treatment required, and in the subsequent care of the patient they will serve for constant guidance as to the care of the teeth. The time will come when X-ray work will be done in completely appointed dental offices, and the practical application of this work to everyday practice will result in the prevention of the development of some pathological conditions, by their early recognition and treatment, thereby protecting humanity from what it has suffered in the past.

Dr. Weisse then recalled several of the

lantern slides shown by Mr. Satterlee, and explained the different points of advantage to the dental surgeon in the recognition of pathological conditions of the teeth, the alveolar processes, and the upper and lower maxillary sub-regions of the face.

After listening to the remarks of Dr. Weisse, the members and guests of the association were invited to partake of a collation served in the exhibit room of the hall.

A motion to adjourn was made and carried.

WEDNESDAY—Morning Session.

The meeting was called to order at 10 o'clock by the President.

Communications relative to the Fourth International Dental Congress to be held in St. Louis, August 29 to September 3, 1904, from Drs. J. A. Libbey, chairman of the Committee on Conference with State and Local Organizations, and C. S. Butler, chairman of the Finance Committee, were read.

Dr. HENRY McMANUS, Hartford, state chairman of Dr. Libbey's committee, made a few remarks on the outlook for the Congress, and asked the society to make a contribution to the Congress fund, also urging as many as could to take membership in the Congress.

Dr. E. S. GAYLORD, New Haven, made a motion that the association make an appropriation of two hundred dollars to the Congress fund.

The motion was carried.

Dr. H. S. SUTPHEN, Newark, N. J., presented to the association a bill with

reference to dentists being appointed in the navy, and asked that the society approve this bill for passage by the House of Representatives, by authorizing the officers of the society to sign a petition for its passage.

Dr. CHAS. McMANUS moved that the officers of the society be authorized to sign the petition presented by Dr. Sutphen.

The motion was carried.

Dr. JAS. McMANUS read a communication from Dr. Kirk, expressing his regret at not being able to attend the meeting, as he was prevented from doing so by sickness.

Dr. McMANUS also read a communication from Dr. Hindsley, expressing his thanks to the society for their sympathy in his bereavement.

Dr. R. M. CHASE, Bethel, Vt., read his paper on "Making Porcelain Inlays by the Impression and Matrix System," as follows:

MAKING PORCELAIN INLAYS BY THE IMPRESSION AND MATRIX SYSTEM.

By R. M. CHASE, M.D., D.D.S., Bethel, Vt.

MAKING porcelain inlays by the impression and matrix system is the result of a method devised several years ago for making gold fillings out of the mouth in a matrix or mold, either by packing gold directly into the matrix and melting away the metal, or by burnishing platinum foil into the matrix and melting scrap gold into the foil, thus forming a gold filling, and cementing the same into the tooth-cavity.

As this method or system was published in several dental journals in 1900, I need not go into details of gold inlay work. Suffice it to say that the materials I used seven or eight years ago were crude and imperfect. The principle, however, was correct, and gave me an incentive to work out and overcome the difficulties incident to an undeveloped system. Porcelain as a filling material should be and is being utilized more and more every year, but only the expert operators have been able to produce this class of work satisfactorily. There is no reason why the average practitioner should not become proficient in this line of work, provided a system is taught that will produce positive and artistic results.

It is needless for me to go into details of cavity preparation for porcelain inlays. This part of the operation has been so thoroughly explained in our dental journals in the past few years that I assume you all are familiar with this important step. Starting, then, with a properly shaped cavity, we proceed to secure a reproduction, or impression, of the same. We divide cavities into the following two general classes:

The first is that of the labial, buccal, and crown variety. Impressions of this class of cavities are to be taken with a special impression compound which after much experimenting and repeated changing of formulas I have found best adapted to the purpose. I might add that to perfect this compound as it is now furnished requires the most painstaking and thorough compounding of the ingredients, taking many days to prepare and temper even a small amount suitable to impression work. This compound copies and retains perfectly the most delicate lines and shape of the tooth-cavity, so essential to the perfect results of this system. As this compound absorbs water readily, it should not be allowed to come in contact with moisture unnecessarily.

The second class includes all the cavities found in the approximal surfaces, and should be taken with my special cement prepared especially for approximal cavities. This cement differs from all other cements, as the mix is made with water, which is readily evaporated, leaving a perfect reproduction of the cavity, and upon the reproduction, after drying, may be poured molten matrix metal without changing its form. This in itself is quite an advance step, as these cavities were extremely difficult and often impossible to reproduce with my regular impression compound or with any other material.

For cavities of the first class take a piece of the compound half the size of an English walnut, working and kneading it with the fingers and tempering it so that it will be a little stiff. If too soft, either roll in a napkin to absorb the excess of glycerin, or work into the compound a little powdered pumice. If too hard, work into the mass a drop or two of glycerin. One or two trials will enable one to temper it just right. Place the compound in a crown impression tray, and work the center of the mass to a point or convex surface; dip the finger into the talcum compound, and rub the surface until it presents a shiny appearance.

With the cavity, tooth, and gum perfectly dry, place that convex point in the cavity, and with a firm and steady hand press the compound into place. This will give a perfect impression of the cavity as well as the surrounding parts, the latter giving ample surface to enable the adjustment of a band of very thin metal without disturbing the cavity impression. The band should be as large as the surface of the impression will allow. Carefully adjust the metal ring or band into

the compound around the cavity impression. See that the edge of the band sinks into the compound to prevent the molten metal from escaping underneath.

To produce a metal suitable for making matrices or cavity reproductions has been one of the most difficult problems in connection with this system, for indeed it must possess certain characteristics not found in the ordinary fusible metals which have been heretofore produced. A metal suitable for this work must be readily fusible, yet exceedingly hard, to withstand considerable pressure without change of shape while fitting the foil matrix. It must cast sharp to reproduce perfectly the angles and edges of the cavity; it must neither shrink nor expand.

Heat two or three bars of the matrix metal in a spoon or ladle to a degree that will just char or brown white paper. When this is accomplished, pour into the band on to the impression. As soon as the metal is cool, separate, and a perfect facsimile of the cavity will result.

The second class, or approximal cavities, requires a different impression material. Having secured ample space, which should be wider than the depth of the cavity, with dam adjusted, mix a little of the special cement with a drop or two of water to the consistence of thick cream, fill the cavity, permitting the cement to overlap the edge of the cavity; in a few minutes the cement will be hard. The cavity having been previously wiped with vaselin or oil, it can be easily removed and should be placed upon a flat piece of compound with the convex surface uppermost. Around this place a metal band, and after heating the filling to expel any moisture, pour the metal into the band.

The cement enables the operator to get

an impression of difficult cavities which would be impossible to produce with the impression compound. The cement impression should be thoroughly dried out to prevent any escape of steam, which would spoil the matrix, either by holding over a flame or by setting aside until all the water has evaporated. Do not be in haste to remove the cement impression from the cavity, as the longer it remains the harder will be the impression and the less liability to fracture when removed. It takes about fifteen or twenty minutes for the cement to harden in the cavity.

Having secured an impression and matrix, the balance of the operation is simple and easy. Cut a piece of 1/1000 or 1/2000 platinum foil of sufficient size to enable its being held steadily upon the matrix with the left thumb and index finger during the shaping, which may be done in the usual way by the use of spunk, burnishers, etc., or in a better way by the use of my matrix-forming device, which makes the shaping of a foil matrix an easy and accurate procedure and one requiring but very little time. The device is of the general shape of a cross-action forceps or pliers with special beaks for the special purposes of this work. Removably attached to one beak is a conical shaped soft rubber point, which, in the forcing of a matrix to the floor and walls of a cavity, exerts its pressure first upon the center, and swages from the center to the surrounding walls with a steady, evenly distributed pressure which minimizes the danger of wrinkling the matrix.

The foundation of a good inlay is a good impression of the cavity in the form of a matrix. Many failures are due to a poor matrix. It will readily be seen that with my matrix-former it is practi-

cally impossible to get a poor matrix owing to the even distribution of the force applied to the foil and the stretching and swaging of the metal from the center.

With my device, matrices are so easily, quickly, and accurately made that in my practice I generally make several so that I can bake several inlays of slightly varying colors at the same time.

The opposing beak of the matrix-former can be used without a covering when forcing the matrix into a metal impression, or can be covered with a protecting rubber shoe for use when the beak is to be placed against a natural tooth.

This in brief covers the general idea of my matrix system. While it seems easy and simple, I would suggest to those not familiar with the technics of inlay construction the importance of first becoming familiar by experimental work with this system, thus gaining a fair degree of skill before attempting actual operation in the mouth. I am often asked if any fusible metal, or clay compound like moldine, or cement can be used. Answering this, I can only say that if years of work and experimenting to develop and perfect this system has not produced perfected materials by which this system can be used with a positive degree of certainty I would not be standing before you advocating the impression and matrix system. I have received so many letters of inquiry regarding it, and as to where the materials can be obtained to successfully use it, that I have made arrangements with the Ransom & Randolph Co. to supply a complete outfit for doing this work, and also the matrix-forming device. I retain personal supervision over the manufacturing of the materials, for upon the proper

mixing and tempering of these materials is based the future success of this system.

With this method of making matrices

combined with a familiarity with the porcelain bodies, I bespeak for you the most satisfactory and artistic results.

DISCUSSION.

Dr. F. L. FOSSUME, New York. I am very sorry that I did not hear Dr. Chase's description of this new metal. I have not been successful with the impression system and the swaging of matrices for inlays. My greatest difficulty has been in approximal cavities. These are the ones which we are called upon most often to fill, and to withdraw the impression without spoiling it is next to impossible. In cervical cavities this difficulty is not encountered, but in swaging or burnishing, the edges of the cast often become rounded and the finished inlay will have a feather edge. I have used cement and stearinized plaster dies, but it is possible that Dr. Chase's metal is hard enough to preserve a perfect edge. Feather edges on inlays break off, and a dark rim will appear around the filling, even when it otherwise fits well.

I prepare simple cavities with flat floor and straight walls. The gingival wall had better be cut at right angles to the floor, and the others at slightly obtuse angles. The orifice will then be slightly larger than the floor, and when the inlay is cemented in place the adaptation at the cervical margin will be the best possible, as the slant of the walls will drive it against this point. The finished inlay will be of uniform thickness, and block-shaped. This form gives resistance to stress, and the filling will not slide or rock in the cavity, and when

roughened and cemented it will stay there.

With reference to the cements best suited for inlay work, they should attain maximum hardness and adhesiveness when mixed to a thin consistence. The cement should also mix smooth and creamy to facilitate flow and occupy less space; and it should also set quickly.

Considerable force is required to drive the inlay into place when cemented. I use an instrument made of ivory for this purpose. There is no danger of breaking the inlay if it has the cube form. I believe porcelain inlays constructed in this way will preserve some teeth better than any other filling, and esthetically it is far superior in any place in the mouth within the line of vision.

Dr. E. S. GAYLORD, New Haven. I desire to call attention to the article in the March number of the *Western Dental Journal*, by Dr. C. C. Allen of Kansas City, in which he describes a new and original method of making matrices for inlays by the use of gum camphor as a means of swaging the matrix in the cavity. I have employed the method, and have no hesitation in saying that by the use of it perfect adaptation and margins can in all cases be obtained. I am pleased to indorse Dr. Chase's method as a means of producing good results where one

wishes to work from impressions, which many times is a relief both to patient and operator.

Dr. CHASE (closing the discussion). While Dr. Gaylord is doing all this, I have the impression; and when you have the impression it takes only a minute to make the matrix, and then you can make as many inlays as you like. With his method you have to go through the same process in order to get a new matrix every time. I think that an impression that

will give you a perfect mold of the cavity and one that you can keep if you like is preferable. You can make several inlays from the matrix, and with one who has not done so very much porcelain work this is an advantage, because we cannot always get the proper color at the first attempt.

Dr. Chase's paper was passed, and Dr. A. J. FLANAGAN, Springfield, Mass., gave a talk on the "Samsioe System of Crown and Bridge Work," as follows:

SAMSIÖE CROWN AND BRIDGE WORK.

By A. J. FLANAGAN, D.D.S., Springfield, Mass.

ONE year ago I promised the president of this society that I would do something at this meeting in the way of a clinic, and I was very much surprised when I found that I was down for an essay. I have no essay to offer; but will in a few minutes describe to you the Samsiöe system of crown and bridge work. Some years ago a young man by the name of Samsiöe attended the Harvard school. It happened that some years before his matriculation he had practiced dentistry in Sweden, and the financial condition of many of his patients was such that they could not afford to spend the money for the more expensive materials necessary for crown and bridge work, so he decided to try and work out a system of bridge work on a very cheap plan with the hope that poor people and dentists in general could have the benefit of this work. He invented a metal, an impression compound, and a soldering acid with which he could take an old rubber tooth and make a very presentable crown.

The whole outfit is bought for the sum of \$2.25, and being interested in charitable work and an attendant at various charitable institutions, the thought struck me that there were many patients that could be helped by this method who were

not able to spend the money for gold work. All of us have a lot of old teeth lying around the office, and if you take this system you can utilize these old teeth, and make a very presentable crown on a very cheap plan, one that is very practical. So far as I can judge, the crown made by this system will compare favorably with many crowns of greater expense.

In using this method you can take German silver or platinoid for the post. Prepare the root in the general way, fit the post, attach the tooth to the post with softened impression compound, and then press the crown home on the end of the root. See that the facing is in the proper position as regards the bite, and after allowing the compound to cool slightly, gently remove the crown and post—now attached together—from the root. Carve the impression material to the form you wish your finished crown to have. Make a plain investment, remove the impression compound and flow in your metal, and you have a very presentable crown. This metal melts at a fairly high degree, and it is a kind of fusible metal. Melotte's metal can be used in place of it, but it will not take as sharp an outline and is not as strong. After some five

years of use I have cases in which there is no breaking away of the metal or porcelain part.

One of the greatest uses of this system is in fractured Logan crowns; and we all have them occasionally in such a condition. The pin is usually in position and cannot readily be removed from the root. What are you going to do with these—are you going to spend two or three hours getting the pin out? I have done this, but now when a case of this kind comes to me I don't worry about it at all. I simply go to work and use the Samsioe system with a plate or rubber tooth for facing. With the pin extending from the root, take the tooth with the softened impression material attached and on the end of the root, placing the

facing in proper position, and allow this to cool. Take the whole off, invest, remove the impression material, and then pour your metal. This is attached by cement or gutta-percha, preferably the latter.

The greatest use of this system consists in its adaptation to charity work. It is not a showy piece of work. The metal, of course, shows on the palatal or lingual portion of the crown or bridge, and in some cases it will darken a little. The method is so simple and cheap that I am surprised that more dentists have not become acquainted with its advantages. I think I shall be able, in my clinic this afternoon [see page 64], to demonstrate a few points of interest in connection with this system.

DISCUSSION.

Dr. G. L. WILCOX, New York. I will demonstrate in my clinic this afternoon the unfitness of platinoid for use as pins in the roots of teeth. I think it is the most detrimental of all metals we can use for making crowns and connecting bridge work.

Dr. D. GENESE, Baltimore. The essayist has mentioned fusible metal melting at a fairly high temperature. It is a very useful article to have around, and any of the fusible alloys can be largely improved by simply dropping a little pure silver in them. The softer metal seems to have the property of preventing expansion in the harder one, and these alloys will fuse at a lower temperature.

Dr. FLANAGAN. I will take pleasure in antagonizing Dr. Wilcox on this

subject. I would like to ask Dr. Wilcox what he uses to set his crowns with.

Dr. WILCOX. In permanent work I never use anything but cement. In temporary work gutta-percha will work very nicely. I have seen Logan crowns after being set for nine years, and to all appearance solid, with just a piece of cotton around the pin, and that crown retained for nine years, showing how little it takes to hold a crown in place. In permanent work, however, I do not depend on anything but cement.

Dr. FLANAGAN (closing the discussion). I do not pretend to be a scientific man, but one of the greatest troubles in society meetings comes from gentlemen getting up and condemning a

thing simply because of a want of common chemical knowledge. Any man who will investigate the cement question will come to the conclusion that there is no cement but what is composed principally of glacial phosphoric acid and zinc oxid. Now, if you mix phosphoric acid with zinc you have a chemical compound. You have the action of a metal on an acid. There is hardly a man but knows that the best metal to use for non-corrosive qualities is pure platinum. Therefore, if you use pure platinum, no matter what the chemical composition of your attachment is, you have a metal which will not be attacked by chemical action. You will find that the greatest trouble in crown and bridge work today comes from the medium of attachment of the crown and bridge. I find that where platinoid or base metals have been used, and you have a film or a solution of gutta-percha surrounding the pin, you have the best medium of attachment you can get. After using gutta-percha for six or seven years, I have never yet seen the corrosive qualities of any ordinary metal brought out to any extent, and why? It is simply a question of common chemistry.

This cannot be said where cement has been used. The first days of laying submarine cables brought forth the benefit of having a gutta-percha film or covering surrounding the center or core of the cable, and to this day a like covering is used. Could any greater evidence of the non-corrosive quality of gutta-percha be asked? Dr. Wilcox, I think, will find that it is not the material but the man at fault this time.

Dr. FONES, chairman of the Nominating Committee, then announced the following nominations for officers of the association:

President—D. W. Johnston, New Haven.

Vice-President—E. B. Griffith, Bridgeport.

Treasurer—W. O. Beecher, Waterbury.

Secretary—F. Hindsley, Bridgeport.

Assistant Secretary—C. C. Prentiss, Hartford.

Dr. JAS. McMANUS moved that the report be accepted and that the secretary *pro tem.* be empowered to cast one vote for the entire list. Motion carried.

Drs. Loomis and Strang were appointed a committee to conduct the new president to the chair.

Dr. A. C. FONES, chairman of the Committee on Necrology, then presented the following report:

We the members of the Connecticut State Dental Association greatly regret to hear of the death of our fellow member Dr. George C. Eighme of Bridgeport, and desire to convey to his family our sympathy and condolence in their bereavement.

Dr. GAYLORD moved that the report be received and spread on the minutes of the association, and that a copy be sent to Dr. Eighme's family.

The motion was carried.

On motion, the thanks of the society were extended to all who participated in the meeting, and to the *Dental Cosmos* for their kindness in publishing the last year's report in pamphlet form.

Dr. McLEAN, in presenting the gavel to the new president, expressed his thanks to the members for their hearty co-operation in promoting the meeting commemorative of the fortieth anniversary of the association, and wished for the new president the same hearty support that he himself had received.

Dr. JOHNSTON, in accepting the gavel,

thanked the association for the high honor conferred upon him, and assured them of his earnest efforts for a large and successful meeting next year.

There being no other business before the society,

The PRESIDENT declared the meeting adjourned until the next annual session.

Some of the Clinics.

Dr. ANDREW J. FLANAGAN, Springfield, Mass. "Samsioe Crown and Bridge Work." The outfit consists of three materials not usually found in the average dental office: Regina compound, Rex alloy, and Rex soldering fluid. These can be purchased of The S. S. White Dental Mfg. Co. for the sum of \$2.25.

Suppose you wish to make a crown similar to a back and solder crown. Prepare your root in the usual way, also post to go into. See if the bite be "close" or otherwise. If "close," take a cross-pin plate tooth and grind a slot in the palatal side of the porcelain from the gum aspect of the tooth to just below the pins. This slot will pass through the space in the porcelain between the pins of the tooth. Take the post and flatten the blunt end so that it will pass through the space between the pins of the porcelain tooth. Roughen or barb this part of the post and also the pins of the tooth. Bend the pins across the post, thus holding the latter tightly to the tooth. Take Regina compound and soften slightly, then mold over the back of the tooth, around pins and post, enough of the compound to represent the amount of backing necessary to contour the tooth. The root being wet, pass the pin into it and you have an accurate impression of the end of the root attached to your crown.

After slightly cooling and being sure

the impression of the end of the root is correct, try it again, and trim the palatal part of the compound so as not to interfere with the bite. Remove from the tooth and invest in plaster, or sand and plaster, leaving just a small part of the palatal aspect of the compound exposed. Where the investment is hard, warm the compound slightly and pick it from around the pins and the back of the tooth. Thoroughly coat all metal parts with soldering fluid, and lay in the hole enough cubes of Rex alloy to about make the contour of the backing. Put over a Bunsen burner and heat until the cubes of alloy soften and drop into place. Remove from the burner, and as the metal is about to congeal take cotton on the end of pliers and press thoroughly home, thus causing the softened alloy to fill every crevice. When cold remove from investment and trim and polish in the usual manner. You can set the crown with cement or gutta-percha, but preferably the latter.

Logan crowns occasionally break, and usually the pin is securely fastened in the root. Leave that pin in the root and remove all porcelain from the end of the pin; and cement also for a short distance around the pin where imbedded at about the gum line. This will make a kind of ring or groove in the cement around the end of the pin exposed. Select a cross-pin flat-back tooth suitable to match the

conditions, and bend the pins in the manner you would if you were to use it in a rubber set of teeth. Try on the tooth to be repaired, and you will find the end of the Logan pin goes between the bent pins of the plate tooth. Remove and mold the Regina compound as in the preceding case. Invest and attach the Rex alloy as in the preceding case. Trim and polish as in the preceding case. If the hole for the Logan pin is not accurate, take a bur and cut out some of the Rex alloy to accommodate the pin. Set with cement or gutta-percha.

There are many practical and very useful ways of employing this outfit in the making of crowns and bridges, and I would refer you to a book published by The S. S. White Dental Mfg. Co., entitled "Plateless Dentures," by Dr. Sam-sioc of Sweden.

Dr. J. H. LYKE, New York, N. Y. "The Jackson System of Regulating." Dr. Lyke demonstrated the Jackson system of correcting irregularities of teeth. He showed the method of constructing appliances, first describing how to prepare a model. An accurate model is made and the teeth are carved slightly at the neck, which causes the appliance when made to fit more closely, insuring good anchorage. The different parts were prepared and held in place on the model for soldering with pins and moldine. He described the different kinds of base-wire, and made apparatus including each form: attached springs of different shapes to the base-wire, both for pushing the teeth outward and moving them inward. Models and appliances of numerous cases were presented, illustrating the expansion of the arch; moving incisors outward; moving them inward; moving canines outward and inward, etc.

Dr. ALFRED C. FONES, Bridgeport, Conn. "Amalgam *versus* Gold Crowns." The object of Dr. Fones' clinic was to emphasize the importance of a flush joint in the restoration of broken-down molars and bicuspidæ in order to maintain a condition of health of the peridental membrane. He claimed that not one gold crown in fifty was a perfect fit, and that the edge of the crown under the margin of the gum formed a shelf for the lodgment of food, which decomposing formed toxins which eventually caused the death of the peridental membrane in adults, causing absorption of the alveolus and the development of Riggs' disease.

Dr. Fones believes that everyone who has passed the age of thirty-five is susceptible to Riggs' disease in some form, it being simply a question of degree. About this age the peridental membrane gradually becomes thinner, and as it grows thinner it is less vascular, and with a lessened vascularity the cells do not possess the vitality and resisting power they had in youth. This contraction is also observed in the Haversian canals in the alveolar process. The exciting cause which produces the death of the cells of the peridental membrane at its periphery is the poisonous products formed by the fermentation, decomposition, and putrefaction of food debris from the action of micro-organisms. Faulty metabolism and constitutional debility would heighten the susceptibility, and extreme unsanitary conditions of the mouth would aggravate the exciting cause.

There were five clinical reasons why he believed this to be the case: (1) Riggs' disease is rarely found in youth. The peridental membrane is thick and vascular, with sufficient vitality to resist irritating products of decomposing food.

(2) It usually attacks teeth in pairs the same as with dental caries. It shows susceptible tissue affected by decomposing food, the same as tooth-structure in dental caries, both exciting causes being local. (3) Pockets or absorption usually first occur in localities favorable for the lodgment of food, generally in the approximal surfaces. (4) It rarely occurs in mouths undergoing thorough instrumentation and polishing by the dentist at frequent intervals and kept clean by systematic brushing. (5) It responds so readily in treatment to cleanliness, antiseptics, and thorough systematic brushing, the brushing also imparting a vascular stimulus to the gums which is felt by the underlying tissues.

The models shown were broken-down molars with platinoid screw-posts cemented in the root-canals, projecting high enough to give an extra support for the amalgam. Ivory matrix No. 2 was used to mold the amalgam and give the support necessary to allow pressure in making a dense filling. At another sitting the amalgam was smoothed and polished, making a flush joint between the restoration and the tooth with no chance for any lodgment of food. In second bicuspid where the palatal or lingual cusp is gone a platinoid screw-post was used, and the amalgam was molded into place with the Ivory matrix. These restorations proved very durable and insured cleanliness and health at the necks of the teeth.

Dr. ALBERT W. COWEE, Hartford, Conn. "A New Rubber Heater." This rubber heater is for the purpose of preparing vulcanizable rubber to be packed.

Advantages. The rubber is kept almost dry upon a clean surface to which it will not adhere, and at the temperature

of steam. So little moisture collects upon the surface of the rubber that an ordinarily dry plaster investment will absorb it, leaving the rubber in such a condition that it will adhere quite firmly to the plaster.

Construction. There are two forms, which we will designate as "No. 1" and "No. 2." No. 1 is probably the most practical for general laboratory use. It consists of two brass or copper rings one-sixteenth of an inch thick and three-quarters of an inch deep, with a circumference of about seven inches, one ring fitting easily within the other. These measurements seem to me to answer best the requirements of general utility. To the outside of the outside ring are soldered or otherwise attached two supports and a handle. The supports are pieces of wire about one and a half inches long, attached perpendicularly, and the handle is a loop of wire attached in the same way; these rest on the edge of the water pan and so support the heater. To complete the apparatus a piece of cloth (an old towel will answer the purpose) is laid smoothly over the smaller ring and the larger ring is forced over it. This tense cloth offers the surface upon which to lay the pieces of rubber, and when the whole is allowed to rest over a basin of boiling water the desired results are obtained. In No. 2 the place of the inner ring is taken by a parallel-sided basin over the top of which the cloth is laid and a plain ring forced down to hold the cloth in place. A hole in the side of the basin, preferably one that may be closed, for the escape of surplus steam, is a convenience.

Dr. F. L. MARSHALL, Boston, Mass. "The Various Uses of the Staple Crown"—showing the crown used as a bridge

abutment; as a support for a frail tooth; as a retainer for gold or porcelain inlays; also its use with porcelain facing in restoring a bite in teeth badly worn by abrasion.

Dr. C. F. C. MEHLIG, New York, N. Y. "Porcelain Inlays of High-fusing Body." The preparation of cavities is made with Mehlig's new inlay bur, whereby the cavity walls are so formed that the matrix may be removed without springing or changing it. The bur has a cylindrical head with rounded corners; the sides and rounded corners are cut like finishing burs, but the center of the face is left smooth so as to prevent cutting the floor of the cavity and not to injure the pulp. The preparation of the cavity should have, above all, straight or evenly curved sharp lines; all sharp angles must be avoided. The walls or margins are polished with diamond-charged engine instruments.

The matrix is now formed, using platinum foil 1/1000 inch thickness for large cavities, and 1/2000 inch thickness for small. A piece of foil larger than the cavity is placed over the cavity and pressed in with spunk. If folds appear they must be burnished out and the edge must be well defined. Gum camphor may be packed in the matrix, which will enable us to remove the matrix without changing; the gum camphor is burned out or washed out with alcohol. This will leave the matrix in a clean condition, and it is ready now for baking. The bodies for inlays are high and low-fusing. The clinician has tried all and greatly prefers the high-fusing; the body used at the clinic being Whiteley's, from which he has derived the best results. To obtain the best results in color, select or mix colors to be a shade lighter than the

tooth when fused, for generally the cement will darken the inlay when cemented. Different colors of cement play an important part in this problem, and experience alone seems to be the best teacher to obtain perfect results. A few points of importance in regard to fusing the inlay should be observed. To prevent feather edge on the inlay the powder must be brushed away from the edge of the matrix so that it is absolutely clean. Two or more bakings may be necessary to complete the inlay, depending on the size of the inlay and the shrinkage of the body. When the inlay is finished it should have an even glazed surface, but care must be taken not to overheat it, as there is danger of burning out the color, which trouble is so often found in using the low-fusing bodies. This reason alone is sufficient to induce one to confine himself to the high-fusing bodies.

The inlay when baked and ready for cementing should be grooved with a small diamond-charged copper disk around the edge so as to form undercuts, or it may be etched with hydrofluoric acid, and washed with alcohol. The cavity is also grooved at parts best suitable for undercuts, and also washed with alcohol, then dried and kept dry until the inlay is placed and the cement is hard. Cover the lines of cement with wax, paraffin, or sandarac to exclude moisture. If there be any sharp overhanging edges after the cement has been removed, they should be polished off with fine disks or Arkansas stones, pumice, and precipitated chalk. If these rules are followed, combined with judgment, success should be the reward.

Dr. F. L. FOSSUME, New York, N. Y. "The Construction of the Porcelain Inlay Matrix with Ivory Instruments."

The clinician's set of ivory instruments for the construction of matrices for porcelain inlays consists of twelve burnishers, which number he believes sufficient for constructing the matrix in any cavity where such a filling is suggested. The advantages in using ivory instruments are that they do not stretch or iron the metal, and consequently the matrix will adapt itself into the cavity much more readily, and will be entirely devoid of that springy and rigid condition which makes it difficult to obtain a perfect matrix—without which a well-fitting inlay cannot be constructed. He found, especially with platinum, that he had to anneal two or three times when using steel instruments, because the metal became so rigid. This had not been necessary since adopting ivory burnishers, and it is comparatively a pleasure to construct a matrix when the metal works so plastic. He always prepares cavities with fissure burs which have flat cutting edges at the point, because a cavity with flat floor is wanted, and the walls as nearly parallel to one another as possible, and almost perpendicular to the floor. If this method be carried out the finished inlay will be shaped like a block of almost uniform thickness, free from feather edges, and when placed in the cavity will not slide or rock; then when cemented, the filling will not be likely to come out.

Dr. FRED A. PEESO, Philadelphia, Pa., demonstrated different methods of restoring missing teeth by inserting removable bridges, and also different styles of anchorage or abutments for removable work. The first and most common of these attachments was the telescope crown. This consists of an inner cap telescoping a perfectly fitting

outer cap, to which the bridge is attached.

This was shown in several specimen cases. One case was where the three lower left molars were missing and had been restored by the use of an extension saddle, the two bicuspid serving as supporting or retaining abutments and carrying telescope crowns.

In two other cases, an upper and a lower molar carried telescope crowns, the mesial end of the bridge being supported, in the upper with a tube and split pin in the canine, and in the lower, with a spur resting in a gold filling inserted in the lingual side of the canine and which had been grooved and countersunk to receive it.

In restoring a missing central incisor in the upper mouth, the remaining central had been devitalized and an iridio-platinum tube inserted. This carried an accurately fitting split pin which was bent and attached to the central dummy. The distal side was supported by a spur resting in a countersunk filling in the lateral.

Another case showed an inlay attachment in a lower molar, the natural crown of the tooth being preserved. The molar was devitalized and a gold inlay with a tube extending through it to the bottom of the pulp-chamber was inserted. The inlay was grooved from the tube to the mesial side and a split pin fitted to the tube and in the groove and attached to the bridge. The mesial end was supported by a spur in a gold filling in the bicuspid.

Another case showed the inlay as connected with a gold crown.

Dr. J. E. DUFFIELD, Camden, N. J. "Baked Porcelain Restorations of Broken Bridge Facings." In the employment of

the method to be described, it is necessary that the pins remain intact in the backing. After clearing away all particles of porcelain which may be adhering to the pins from the fractured facing, a cement filling is built around the same, making the sides parallel, and extending in a lateral direction only far enough to include the overhang of the pinheads, the filling being flush with the tops of the pins; the object being to permit of the free drawing of the matrix about to be made. Platinum foil, gage 1/1000, is then burnished over the entire backing. The matrix is then removed and a quantity of tooth-body of the desired shade is placed on the matrix and fused.

There now being no danger of destroying the perfect adaptation from handling, it is again placed in position on the backing and a porcelain veneer or plate tooth from which the pins have been re-

moved, and of a proper shade, is ground in position; additional tooth-body is added to the matrix and the under side of the veneer, which is then placed on the matrix and gently pressed into position; apply a few blasts of hot air to carry off the superfluous moisture of the body, then with an excavator the matrix and veneer, as one piece, is gently lifted off the backing and allowed to fall on a doily. It is then placed in the furnace and fused, the platinum foil stripped off the back, and with a small diamond disk the box or countersunk cavity is undercut, when on removing the filling from the pins in the backing the work is ready to be cemented in position.

If the operation has been carefully executed, we now have a repair which in point of contour and adaptation is eminently satisfactory, and one which is approximately as strong as the original.

TRANSACTIONS

OF THE

Connecticut
State Dental Association

AT ITS

Forty-first Annual Convention

HELD AT

NEW HAVEN, CONN.

April 18 and 19, 1905.

PHILADELPHIA :

THE S. S. WHITE DENTAL MANUFACTURING CO.

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TRANSACTIONS

OF THE

Connecticut State Dental Association,

AT ITS

FORTY-FIRST ANNUAL CONVENTION,

HELD AT

New Haven, Conn., April 18 and 19, 1905

TUESDAY—Morning Session.

THE forty-first annual convention of the Connecticut State Dental Association convened in the Y. M. C. A. Building, New Haven, Conn., April 18 and 19, 1905.

The first session was called to order on Tuesday, April 18, at 10 A.M. by the president, Dr. D. W. Johnston of New Haven.

The first order of business was the reading of the minutes of the last meeting, which was on motion dispensed with, as they had appeared in printed form.

The next order of business was the report of the treasurer, Dr. W. O. BEECHER, Waterbury, as follows:

TREASURER'S REPORT.

WATERBURY, CONN., April 18, 1905.

Received from Dr. E. B. Griffith	\$459.34
“ for dues	138.00
“ from exhibitors	38.00
	<hr/> \$635.34
Expenditures, as per vouchers	339.08
	<hr/>
Balance—Cash on hand	\$296.26
Respectfully submitted,	
W. O. BEECHER, <i>Treasurer.</i>	

Motion was made and carried that the report be adopted as read.

The next order of business was the reports of committees.

Dr. E. S. GAYLORD, chairman of the Legislative Committee, having been called on for a report, presented the following: I have no special report to make. I think the members are familiar with what has been done relative to getting a new bill through the legislature. I do not think it necessary to make any statement with regard to that. All the members understand that there is a bill pending, and now in the hands of the Committee on Public Health, and will be presented in due time to the legislature. Of course nothing more can be done at present.

On motion the report of the Legislative Committee was accepted.

Dr. EBERLE, chairman of the Committee on Neurology, reported as follows:

REPORT OF COMMITTEE ON NECROLOGY.

Mr. President and Members of the Connecticut State Dental Association:

Your Committee on Necrology respectfully reports and recommends the adoption of the following resolutions on the death of Drs. Chas. P. Graham and J. J. Lavin:

DR. CHAS. P. GRAHAM.

Whereas, Since our last meeting one of our honored and esteemed members, Dr. Charles Parmele Graham, was, on November 1, 1904, called from his earthly labors and will meet with us no more, we give this expression of our feelings in the loss we have sustained.

Dr. Graham was born in Utica, N. Y., coming to Middletown, Conn., in early life; he studied dentistry under Dr. Luther Parmele, and later acquired a large practice himself.

Dr. Graham was prominent in military circles, advancing from private in 1871 to brigadier-general in 1885, and in 1895 was appointed adjutant-general by Governor Coffin.

He was a member of the first Board of Dental Commissioners, and later was elected president of the board.

Dr. Graham was one of the original members of the Connecticut State Dental Association, joining as a charter member in 1864, and was president in 1895.

As an active church worker at Middletown, Dr. Graham's many years' residence there gained for him much respect and esteem.

Therefore he it

RESOLVED, That we testify to the loss we experience in the death of Dr. Graham, and that we extend our sincere sympathy to his family; and further, That these resolutions be spread on the records of this association and that a copy be sent to Mrs. Graham.

DR. JAMES J. LAVIN.

Whereas, We mourn the untimely death of our fellow-member and friend, Dr. James J.

Lavin, who on March 17, 1905, joined the great association of those who have gone on before.

He came to Hartford from Middletown, Conn., in 1893, and studied dentistry under Drs. George F. Barrett and Charles K. Bryant. Dr. Lavin made many friends, and in 1901 started in practice for himself. In 1899 he was elected a member of this association. Though of a retiring disposition, he was respected and admired by those who knew him best.

Therefore he it

RESOLVED, That we express our heartfelt sympathy to his wife, and that these resolutions be entered on our records and a copy be sent to Mrs. Lavin.

Representatives of this association were present, and floral tributes were sent to the funerals of both Dr. Graham and Dr. Lavin.

Motion was made and carried that the report be accepted.

Dr. EBERLE. Do I understand that the acceptance of the report is the adoption of the recommendation that the resolution be published.

The PRESIDENT. Yes, sir.

The Secretary then read a letter of resignation from Dr. J. A. Webb, now located in Denver, Colorado.

Dr. E. S. ROSENBLUTH moved that the resignation be accepted.

Motion carried.

The vice-president, Dr. E. B. Griffith, Bridgeport, was called to the chair, and

The president, Dr. D. W. JOHNSTON, read his annual address, as follows:

PRESIDENT'S ADDRESS.

By DAVID W. JOHNSTON, D.D.S., New Haven.

Ladies and gentlemen—members of the Connecticut State Dental Association and guests:

In behalf of the members residing in New Haven I extend to you a most cordial welcome to our city. This being the forty-first annual convention of the association, and the first time in many years it has met outside the city of Hartford, it has been the earnest desire of the officers to keep up to the standard of our preceding conventions and present you with a program containing the names of able and well-known essayists and clinicians. Whatever success this convention may attain I attribute to the officers and different committees who have been so successful in bringing about these results, and I wish at this time most heartily to thank them.

I am not going to take your valuable time in speaking of the advance that is continually being made in the different branches of dentistry, for the dental journals are keeping you well informed on these matters.

Never before in the history of dentistry in our state has the dentist manifested such interest in his profession as at the

present time. The organizing of local dental societies in our different cities, the frequent meetings where the incidents of office practice and professional opinions and experiences are continually being discussed are invaluable to the young as well as to the more experienced practitioner.

I would also like to call your attention to our dental commissioners. We cannot overestimate the important work they are doing in this state, where with our limited dental laws the public greatly needs protection from the incompetent dentist, and I suggest that action in some form be taken to show the appreciation of this association for their work.

As there is much of great interest to us all to be crowded into the short space of two days, I will take no more of your time, but simply express the sincere hope that all who have made the effort to attend these meetings will at the close of the convention feel amply repaid for their trouble. May this association continue its progress in the work for which it was organized—namely, the advancement of its members in professional knowledge and the better establishment of fraternal love and good fellowship.

Dr. GRIFFITH. Gentlemen, you have heard the President's address. What is your pleasure?

Dr. C. C. PRENTISS, Hartford. I move
that the address be accepted.

Dr. JAMES McMANUS, Hartford. I would like to amend that motion by adding that it be referred to a committee for consideration, and that this committee report back to the association before the close of the meeting.

The motion was carried.

Dr. Griffith then appointed the following Committee on the President's Address: Dr. C. F. Gibbs, Bridgeport; Dr. F. E. Roys, Winstead; Dr. A. H. Spicer, Westerly, R. I.

The President then resumed the chair.

The next order of business was the election of officers.

Motion was made and carried that a committee be appointed to make nominations to the society.

Dr. Johnston appointed the three former presidents—Drs. Edward Eberle, Hartford; G. O. McLean, Hartford, and Henry McManus, Hartford—as the Committee on Nominations to report at a future meeting of the society.

Dr. E. S. ROSENBLUTH, chairman of the Clinic Committee, announced that two additional clinics, which came too late for insertion in the program, would be given by Dr. P. B. McCullough of Philadelphia and Dr. L. C. LeRoy, New York.

The President asked if there was any other business to come before the society.

Dr. O. T. RULE, Meriden. I would like to ask if there is anything in the by-laws covering the admission into the society of men who have at one time been practicing as advertising dentists; that

is, as to how long a time should elapse after giving up advertising before they are eligible to become members of the society.

The PRESIDENT. That is covered by the by-laws, and I think the by-laws state that a year is sufficient time after giving up an advertising business to become a member of the society.

Dr. RULE. I would like to ask also if there is anything in the by-laws or constitution defining what amount of advertising constitutes an offense against the code of ethics of the society. For instance, we all know that the insertion of a professional card is not an offense, but we also know that the insertion of an announcement covering five or six inches in a newspaper is an offense. What I want to know is just what constitutes an offense in this direction. For instance, the words "painless dentistry" on a sign or door. Does that constitute an offense that would debar a man from membership in the society? I think it would be well to define these things, and have action taken on them, so that those making applications who have been guilty of offenses along this line could be promptly disposed of.

The PRESIDENT. I think the by-laws cover the ground pretty well, and of course the names go before the Board of Censors before they are acted on by the society.

Dr. E. S. ROSENBLUTH. I have received two communications from Dr. Williams Donnally of Washington, relative to an army and navy bill which is now in charge of the committee on dental legislation of the National Dental Association. Dr. Donnally has been making a determined fight before Congress toward uniform rank for those den-

tists who shall be in the service of the navy department, and he has asked that the Connecticut State Dental Association give its indorsement to the efforts to obtain for these dentists a rank equal to that of the medical men; that is, the rank of commissioned officers instead of that of contract surgeons. I think it is no more than our duty that we do so, and I therefore move that this association give its hearty indorsement to the efforts of the committee on dental legislation of the National Dental Association.

Dr. JAMES McMANUS. In seconding that motion I will say that a resolution was passed by this society a year ago, which I do not think expressed its real sentiment. When I say its real sentiment, I mean that it did not express the real sentiment of the individual members of the association. I do believe, however, that a large majority of the dentists of the country are heartily in favor of sustaining any action of the committee of the National Dental Association, which has for a number of years been working for the benefit of the soldiers and sailors of the country. They have asked—and reasonably asked, I think—for the appointment of dental surgeons to commissioned rank, the same as that of the medical practitioners in the army. I believe, as I said before, that a large majority of the dentists of the country are in entire sympathy with the efforts of the committee of the National Association, and I want this association to express itself strongly that we sustain the action of that committee. I therefore second the motion of Dr. Rosenbluth.

The motion was carried.

The CHAIRMAN. If there is no further business before us, I will call on Dr. J. Tenney Barker, Wallingford, recorder

of the State Dental Examiners, for the report of the dental commissioners.

Dr. BARKER. I do not think it necessary for me to make any report at this time, as the annual report of the commissioners, I think, covers the entire ground. All I can do at this time is to give a few figures that may possibly interest you. On the state records there are legally entitled to practice dentistry in the state of Connecticut six hundred and thirty-six dentists. Fifty-five of this number are dead; eighty-two have removed from the state, eight have retired, and sixty-two cannot be accounted for—making a total of four hundred and twenty-nine practicing in the state and registered. During the year the commissioners have examined one hundred and fifty candidates, ninety-two of whom passed and fifty-eight failed.

I want to say one word in defense of Dr. Pratt regarding charges which were made against him, and which were untrue. It has been charged against him that he has shown partiality in marking the papers of the candidates. Now that is untrue because no one of the commissioners knows who the candidates are until after the examinations are passed, and the averages figured out. Each candidate is known by his number, which is given to him by my good wife—who has charge of that part of the work—and none of the commissioners know who the numbers represent until after the examinations are passed and the averages figured out.

The PRESIDENT. I am sure we all appreciate the remarks of the recorder of the commissioners. If there be no further business I would ask for a motion to adjourn until 2 o'clock this afternoon.

Dr. E. R. WHITFORD, Hartford. Is there no action to be taken on the report of Dr. Barker?

The PRESIDENT. I did not think that it was intended as a special report. However, I will place it before the meeting,

and ask what your pleasure is regarding the report of the commissioners.

Motion was made and carried that it be adopted.

Motion was carried to adjourn until 2 P.M.

TUESDAY—Afternoon Session.

The second session was called to order at 2 o'clock by the president, Dr. D. W. Johnston.

The first order of business for the

afternoon was the reading of a paper by Dr. L. ASHLEY FAUGHT, Philadelphia, Pa., on "Therapeutics in Everyday Practice," as follows:

THERAPEUTICS IN EVERYDAY PRACTICE.

By L. ASHLEY FAUGHT, D.D.S., Philadelphia, Pa.

SOME years ago, when I was a student of medicine, the professor of surgery had a phrase in which he seemed to take peculiar delight, and in which he not infrequently expressed himself to the class in the moment of affording surgical relief to some poor suffering patient. "Gentlemen," he would say, "behold the blessing of the antiphlogistic touch of a therapeutic knife." In it he felt the embodiment of surgical therapeutics, and it has always remained fixed in my mind that as surgeons—at least, if you please, as dental surgeons—there are other therapeutics than that which is ordinarily thought of as the usual meaning of the word. To say *therapeutics* is to universally signify the employment of drugs, although the dictionary definition of the word is "that branch of medical science which treats of the application of *remedies* to the cure or alleviation of disease"; and while I shall in this short address incidentally tell you of the drugs I use, I shall, in the broader latitude of meaning thus afforded me, speak of the remedies which as a dentist I daily apply in combating that rampant disease, dental caries.

Your essayist comes not to you puffed up with the idea that he will present new

or original teaching. He sees before him men of years, full of ripe experience; but as one who has laboriously toiled with you, it is his desire to present a plain unvarnished tale which shall open a thought in the mind of the young practitioner—and to which, in the discussion, you may add such additional suggestions as may to this class prove of great assistance. It is, then, to the young practitioner of dentistry that I especially address myself.

If there be one thing more than another in daily practice which has impressed itself upon me, it is the insidiousness of dental caries. We talk about it in an offhand way, and we flatter ourselves that we are familiar with this fact; but, day in and day out, I am convinced as I stand by the chair and examine the mouths of patients presenting, that the average dentist has not reached the point at which he translates his belief into doing. New patients present themselves too frequently in whom an exhaustive inquiry discovers too many points of existing dental caries to longer allow the belief that they have received in the past the most careful dental treatment.

I am well aware that there are many

reasons to be given to explain this condition—unwillingness of the patient to submit to treatment, inability to properly remunerate for services, etc., but, inasmuch as in the cases coming under my observation all is in time accomplished and proper fees rendered, I can but believe, as I have stated, that the fault is usually with the dentist.

And so, at the risk of criticism for this plain speech, I wish to advocate the view that dental therapeutics commences with that appreciation of the insidiousness of dental caries which shall cause each one of us to approach a mouth presenting for our care with the determination that the initial steps shall be a thorough cleaning, scaling, and polishing of the teeth, and a careful examination by positive illumination, by the use of wedge and explorer, to the finding of every point of disease and the laying bare to the patient the exact condition—fearlessly, boldly, and honestly expressing both to the patient and to ourselves the existing state of affairs, and under no conditions allowing the patient to think all is well with the mouth until we know that all is well. Let what is done be done thoroughly; and if time, or money, or any other thing, will not permit us to give the mouth complete treatment, let the patient go away knowing the treatment is incomplete; let him depart with the full knowledge of his need. Impress upon patients that an incomplete treatment of the mouth is a very undesirable condition, for decay untreated is a menace to the rest of the mouth; and urge upon them the great desirability of receiving temporary treatment, at least, to serve until more thorough attention can be obtained.

You see, gentlemen, I wish to do away with that alluring habit which I fear is growing upon too many practitioners of

dentistry, that of treating large cavities of decay—the more observable or prominent ones—and the nursing along of a mouth by allowing the patient to think all is well until some future return, by which time the omitted minor cavities have grown in size and are thrusting themselves into notice. This nursing may have the seeming advantage of not sowing dismay in patients, or of taxing their pockets too heavily at any one time; but it is unjust to them, and exceedingly unjust to the profession. I trust I have made it clear that therapeutics in everyday practice includes *primarily* the means so well known to us all by which the teeth may be placed, at least temporarily, in the clean, healthy, and serviceable condition in which nature intended them to be, and that the attainment of this condition is the first duty a dentist owes to his patient and to his profession. Not until the public dreads and is ashamed of unclean mouths will the star of dentistry rise to the zenith of its true dignity; and this will not be until dentists universally shall begin each new relationship by such an application of these therapeutics as shall teach the public what it ought to know and to believe.

I now wish to direct attention to the finishing bur as a therapeutic remedy; and in speaking of the effects to be gained by its free use I wish to include its auxiliaries—approximal trimmers, files, disks, and finishing tapes. I am sure, after a moment's reflection, you will agree with me that while it is our pleasure at times to have a mouth present for treatment in which the former work is a perfect dream of beauty and usefulness, such a condition is seen only at times. More often, indeed the usual experience, is for our critical eye to see fillings in a more or less unfinished state—fillings with rough,

unpolished surfaces, with overhanging, protruding, or jagged edges, faulty contour, etc., the result either of being left in that state or the effect of time, use, or wear. Your essayist refers to these things now for the purpose of inculcating that it is good therapeutics, and demanded for thorough treatment, to devote the time and labor necessary to restore proper conditions of these fillings; to bring them up to a state of perfection, and to make them serviceable in the highest degree to resist decay. And right here, in giving this service, comes a call for the full appreciation of the beauty, shape, and usefulness of a natural tooth—made as nature intended to make it. I believe we are all contourists now, but I am not aware that attention has been directed with special emphasis to the great necessity of contouring the occlusal surfaces of the teeth so as to keep their normal shape and design. Flat fillings in the sulci, and flattened conditions elsewhere on the occlusal surfaces, are too much in evidence for the attainment of the true function for which nature has thrown the bicuspid and molars into convolutions. I believe it is our duty to most carefully restore the shapes of occlusal surfaces, as well as to maintain contour in the approximal and other surface relationships.

Having now delivered myself of these things under the wider latitude of the technical meaning of the word therapeutics, I wish to speak more in accordance with its usual meaning, and talk of one or two drugs which have been of daily use to me.

I have found that trichloroacetic acid, in ten per cent. solution, has great merit in reducing inflamed marginal edges of gums to a condition of health, particularly where the gum is broken out from the interspaces of molars and bicuspid.

I apply it by means of a pointed orange-wood stick carefully inserted between the gum and the teeth. Two or three applications made at intervals of a day or so will work wonders.

Another favorite drug of mine is silver nitrate. This I use in a forty per cent. solution—with great care, of course, as this solution is caustic in its effects, and needs to be applied with great directness, every precaution being taken to confine it to the exact territory indicated for treatment. One or two applications will cure hypersensitivity at the necks of molars, both to touch and to thermal changes. I believe that its use will limit the tendency to decay, and for this purpose it has great merit when we are caring for the third molars. These teeth are of value, and, as you all know, on account of their situation in the mouth, are exposed to peculiar attack. The cleaning process at the hands of the patient too often fails to extend far enough back to reach them, and continual neglect compasses their destruction. They are difficult teeth to fill, and with the loss of their pulps are practically impossible teeth to satisfactorily treat, their total loss soon following. My discovery of the application of forty per cent. silver nitrate to dental purposes has been a boon to many of my *clientèle*. In this strength it is absolutely germicidal, and with it I feel able to cope with many situations in which formerly I was absolutely powerless. It is a great comfort-giver.

In the matter of drugs for root-dressing, I quite agree with Dr. D. D. Smith when he says, "If it be proper to speak of specifics among remedies, creasote—pure wood creasote—is a specific as a root-dressing." I have always found it so in the cases in which I have used it, and in thirty years' practice they have

not been few. The honors, however, where staining has not to be considered, are with me about equally divided between it and a preparation made from oil of cinnamon, which I believe to be cinnamic acid. Securing true oil of cinnamon, I keep it in a bottle from which the cork is permanently removed, the orifice and neck of the bottle being kept loosely stuffed with fibers of cotton to prevent the ingress of dust or foreign matter, yet so as to permit a free circulation of air. In time, the oil of cinnamon undergoes a change, darkening in color—an oxidation—and the liquid then has properties peculiar to itself, vastly different from oil of cinnamon; it is less irritating, far more healing, preservative, perhaps germicidal. As a root-dressing, either alone or in combination with aristol, I like it and therefore use it.

So much for the definitely practical side of this paper. Now, before closing, I wish to indulge in a little theory. An idea has come to me lately which seems to contain a kernel of truth and a promise for the future. I have not had time to experiment enough with it to say anything positively regarding it; still I wish to mention it, that others may help in its development. If there be one condition of the teeth more than another which is today attracting the attention and concern of our patients, it is erosion. Too frequently, beautiful teeth, the pride of their possessors for some years, at a definite period of life begin, in spite of excellent personal care, to show the fatal marks of erosion, and appeal is made for treatment. Our therapeutics institutes the usual local and systemic treatments; but we know, and in time the patient finds out, that we have by no means compassed the disease. Erosion continues, recession

of gums continues, and failure stares us in the face. These two diseases, or symptoms of diseases if you please, are masters of the situation—an overpowering local condition. True it is, I believe, that our therapeutics would not be without benefit if the patients would be as much in earnest as we dentists are, but after a short spasm treatment is neglected. Indeed, the patients are deeply grieved at the disease and its progress; but they wish the cure to come at once, as by the waving of a fairy wand.

An allied condition to this erosion and recession of gums, at least in its distressing effects, is that in which caries becomes rampant in spite of our best efforts. We know that there are mouths in which, owing to the peculiar morbid condition of the secretions, recurrent decay sets in again and again, and the teeth fairly melt.

To meet these three diseases here outlined—erosion, recession of the gums, and proneness to dental caries—I think our therapeutics should develop remedies which when systemically administered would alter the nature of the deleterious secretions in their very production. To change acid secretions to alkaline, to change alkaline secretions to acid after they are poured into the mouth, is not exactly the way to do the trick. Local mouth-washes have proved more or less impotent. It remains yet for the dental profession to do better than this—to develop, by experiment, drugs which when systemically administered will, during the time of their exhibition at least, absolutely control the nature of the secretions of the mouth, producing the character desired. I am at work in this direction, and hope to make to the profession a report at some future date.

DISCUSSION.

Dr. C. W. STRANG, Bridgeport. The very excellent paper that has just been read emphasizes thoroughness in every department of our work. The essayist made so many good points that I cannot hope to touch on all, even for a moment, but I will dwell on one or two, leaving the rest for the others who may take the floor after me.

This matter of thoroughness—thoroughness as to examination, thoroughness in the cleansing of teeth—means a great deal. It means that there must be fixed in the heart of every operator the golden rule, “Do unto others as you would that they should do unto you.” It is not easy, I admit, for the busy operator to carry out this idea at all times, under all circumstances, and in all departments of his work. For instance, there come to the office persons who desire examinations. You may be busy, and you express yourself along this line—that you cannot give them a thorough examination because you have not the time. They say “Oh, it will only take a moment.” Now, a moment’s examination is a worthless, delusive, and a dangerous thing, and I do not want to take upon myself the responsibility of saying to a patient that his teeth are in fairly good condition, that so much needs to be done, and so-and-so is the trouble in the case. Every operator should take time to go to the bottom of things, so that he can hold up his hand and say, You have so many cavities that need filling, and such a treatment is required. We do not want to take risks with our teeth. When a patient goes to an operator for professional ser-

vice he wants to know what should be done. And so it is according to my way of thinking by far the best way to decline to take the responsibility upon our shoulders, unless the patient is willing to make a special appointment, when we may have time to make a thorough examination; and if patients do that it will largely eliminate the very unpleasant duty of destroying exposed pulps and treating pulpless teeth.

Now, in regard to the matter of thorough cleanliness: I notice that the essayist has emphasized that point particularly. I grant you that it is more fascinating to make gold operations, and indeed to do almost any kind of filling, than it is to be thorough in the cleansing of teeth—to spend hours of time upon a mouth in order that we may bring about a state of absolute cleanliness. Many years ago there was created in my heart such a horror of pyorrhea alveolaris, and my teachings as a student were such that I tried from the beginning to the very best of my ability, with the instruments at hand, to keep the deposits from the teeth of my patients; and I want to say that nothing has been of greater satisfaction to me than my efforts made years ago right along that line. While perhaps the majority of us have endeavored to be thorough in finishing approximal fillings, not to allow any margin of the filling to protrude beyond the cavity margins, not to leave along the cervical wall protruding or rough edges, I will venture to say that many of us have had the experience, upon examining some of these fillings one, two, or three years afterward, to find that in our operations

along the cervical walls a surplus of filling material had not been trimmed off. Perhaps some have not had that experience, but I have had it, not altogether with gutta-percha fillings on the approximal surfaces—for you know gutta-percha has an erratic way of protruding outside the cavity; I refer to gold fillings that we have endeavored conscientiously to trim until we supposed we had it down to the cavity margin.

Now, in regard to the application of medicaments, it was said of old Dr. Riggs that he depended entirely upon surgical means, and he had no confidence in the application of medicaments in the treatment of pyorrhea alveolaris. I have a recollection that Dr. Riggs used to say that in his treatment of pyorrhea he did not want any dog-water about it; I don't know what he meant exactly. For many years I practiced along that line, and felt that what could not be accomplished by the removal of calculus from the teeth, and consequently all sources of gum irritation, would not be specially benefited by the application of medicines. I have, however, changed my mind, and I believe the application of medicaments to these pyorrhea pockets will be attended by gratifying results. I have had no experience with trichloroacetic acid, but I use aromatic sulfuric acid largely in my practice. I have heard others speak in very high terms of trichloroacetic acid, but I prefer to use the aromatic sulfuric acid.

Dr. J. E. HEYKE, New Haven. As I did not have an opportunity to read the paper before it was presented, I cannot go into a detailed discussion of it. One question, however, always presents itself to my mind whenever a certain one out of a group of agents of similar action is singled out as being particularly benefi-

cent. Some men, for instance, speak of the great efficacy of sulfuric acid; others again can't imagine how any man with just a little sense left can use anything but lactic acid; still others, and among them the essayist, are wonderfully impressed by the unparalleled transposition of pathologic conditions accomplished by the antiphlogistic touch of trichloroacetic acid applied with a stick of orange-wood. How much wiser we would grow if all the men who read papers before dental associations would stand up and give some reason for using a certain medicine, or tell how it differs in its action from other agents of a similar nature!—for instance, in this case, how a burn from sulfuric acid differs from those of lactic and trichloroacetic acids. That would be adding something to our knowledge instead of raising a gyrating windstorm.

Dr. S. FREEMAN, New York. This paper is ideal, but in presenting it Dr. Faught has overlooked the main point, and surrounds his treatment with so much mystery that it behooves me to request him to state what method he is employing at the present time to produce those systemic conditions which will alleviate or retard that disease, erosion, as I am positive that we all would prefer to work on lines on which we could offer our patients some relief.

Dr. JOSEPH HEAD, Philadelphia. The point I wish to speak of is Dr. Faught's systemic treatment. We know that the ordinary erosion is at least partly caused by either acid sodium phosphate or acid calcium phosphate. We also know that the piling up in the blood of carbon dioxide, owing to a lack of perfect oxygenation, tends to cause the excretion of these acid salts. We also know, according to Miller, that the bacteria increase more rapidly

in alkaline than in acid solution, and as Miller has also pointed out, that in an acid mouth the acid will cause tooth-decay, and in an alkaline mouth the bacteria will grow more rapidly, finally generating an excess of acid that will attack the teeth. So, in speaking of this question of how to combat erosion by systemic drugs, Dr. Faught would do well to show us how to avoid the horns of this dilemma. If medicines are given which will cause the saliva to change from alkaline to acid, the tone of the system may be so lowered as to cause oxygenation to be retarded, and harmful acidity increased. Or if a saliva is changed to acid from alkaline, there may be an extra flow of acid calcium phosphate. The administration of drugs is an extremely complicated problem, for when we give drugs for a specific cause we stir up a great many factors in the system of which most of us know little. For instance, some of us can take quinin to cure a cold, because quinin does not stir up certain centers, and acts almost as a sedative in these cases; but in others quinin acts as a profound excitant. So when we are trying to give these drugs to counteract the erosion we should bear in mind that we are working in a field where there is risk of doing harm as well as good.

Dr. R. OTTOLENGUI, New York. I agree with Dr. Freeman that it would be interesting to us to know a little more of the special line of experimentation in which Dr. Faught is engaged. Without knowing that, however, I venture to prophesy that if he is looking for a tabloid to prevent or cure erosion he will not find it.

Dr. Faught made a statement in his paper which is true only to a certain extent. In speaking of teeth which are

sensitive at the necks, and in cases of recession of the gums, Dr. Faught spoke of silver nitrate, and alluded to it as rather a curative agent, both in inhibiting caries and in acting to alleviate the distress of sensitive teeth at the neck, especially in the presence of recession of the gums. Now, I have seen this advocacy of silver nitrate very frequently, but have you ever stopped to think why it acts at all? I am not chemist enough to be certain of my ground, but I think these teeth are sensitive because they are superficially destroyed by the acids of the mouth. You will notice that this sensitiveness rarely if ever occurs on dentin which has been denuded of enamel, but mainly at the neck of a tooth or at a portion beyond the neck which has never been protected except by cementum. I take it that this perhaps has become softened by acid action. Now, what does silver nitrate do? I may say if you apply the rubber dam and then give the parts a treatment, you get better results, which is evidence of the correctness of my theory, which is that you simply protect the parts by coating them with silver nitrate. I believe it is nothing but a mechanical protection—the coating of the denuded parts.

Dr. HEAD. It has an antiseptic effect at the same time.

Dr. OTTOLENGUI. I admit that, but what I want to get at is the treatment through the system. Dr. Head has very prettily pointed out that you are confronted with two horns of a dilemma. If you make an acid condition you have one difficulty; if you make an alkaline condition you have another. What is the normal condition of the mouth? It seems to be one of neutrality. If that be true, it should be the physician's aim to restore the normal function of the

entire body. I am going to relate an instance in practice that is significant in this respect. I had a patient who suffered from this intense sensitiveness around the necks of the teeth. I went through the whole list of treatments, but the patient obtained no comfort. The use of alkalines locally would give a little temporary relief, but if the patient forgot to use the medicine the pain would return again. This was not a disease condition, it was just simply recession of the gum from advancing age. Now the history of the case was that this man had at one time been a liquor-drinker. In time he changed from the ordinary whiskey to a diet of different liquors. Finding that one interfered with his digestive functions, he tried other liquors. Finally he had a serious spell of sickness, and was close to death, and after some consideration on his part he decided that he had been making a mistake in drinking anything at all. Not from a moral standpoint, but because the use of stimulants was destroying the functions of his organs. He thereafter abstained absolutely, and this peculiar result has come about that he has an increased flow of saliva, he has a better condition of blood, and he is in fact in better health than he ever was. As this change has occurred the sensitiveness around the necks of his teeth has disappeared, and a test of his oral fluids shows that they are now neutral.

In reference to Dr. Strang's remark about "dog-water," I will say that it is nothing more or less than zinc chlorid. The expression of dog-water was applied to it by plumbers to designate the bottle and its contents.

Dr. M. L. RHEIN, New York. I think we have rarely listened to a paper deserving of a fuller discussion or of more

meritorious character than that which we have just listened to. As I have been asked to say a word or two on this subject I desire especially to emphasize what Dr. Strang said upon this question, namely, that if we are going to treat a patient, that we ought to do so absolutely as we individually would like to be treated were we in the patient's place. That has been the keystone of every dentist's success, and the failure to follow that divine law in practice has brought about all the detracting elements of criticism which dentistry has received, either in this country or in any other. I want to add my hearty indorsement in regard to what the essayist said about the preliminary placing of the mouth in an absolutely clean condition, and to maintain a state of cleanliness, if the patient expects his dental organs to remain in a proper condition.

Now a word in regard to the question that has been under discussion—the question of erosion, the one that has been such a bugbear to us in years gone by, and one which has been wonderfully illuminated in the last few years, especially by the work of Dr. Kirk of Philadelphia. And I may add for the benefit of those who are interested, that in the April number of the *Dental Review* there is the most exhaustive article on this subject that has yet been published, being a *résumé* of everything done in the past, and following out the line of work that has been so well done by Dr. Kirk, Dr. Hinkins, and others. Here is brought out the true principle involved in this subject, and this consists in restoring (but it cannot always be done) the true physiological condition of the patient. It is impossible for erosion to exist under such conditions. If the proper physiological condition of the

system can be restored, that will put an end to any progress of erosion. All the investigations up to date have absolutely proved that to be a fact. It depends entirely upon the ability of the dentist or the physician who has charge of the patient to accomplish this result, and both the previous speakers have wisely said that it is not a question of changing the oral fluids from an acid to an alkaline condition, but it is a question of stopping what has brought about this abnormal condition of the system, because this is simply an expression of an existing abnormality. This abnormality often arises from the vital organs, the lungs, liver, heart, and kidneys, and certain forms of auto-intoxication. Where the average physician fails to find anything wrong with the patient, and we see this condition of erosion existing, the cause can generally be found in auto-intoxication, especially in people of sedentary occupations.

Now, a final word in regard to the local treatment. I have had remarkable success in the treatment locally of erosion; I mean the stopping of the inroads of erosion, the stopping of erosion itself, even where I realized that I have not been able to effect a constitutional cure. The reason that these abnormal conditions produce acid mucus is because around the gums is found the point of least resistance. The capillary system at this point anastomoses to so great and fine a degree that anything in the circulation that is detrimental is most liable to find here a seat for its systemic expression. If we can shift that symptom to some other part of the body we relegate the patient to some other class of practitioners—which is the point I want to bring out; and that can be done by improving the tone of the circulation

of the gums. I do not care how you do it, but if we can keep the mouth absolutely clean, keeping the circulation of the gums in a healthy condition, we shall not have any local expression of abnormality. I have tested this over and over, and by means of massage of the gums in various ways, performed more or less frequently, according to the demands of the case. But you may ask how I know I get these results. Erosion is progressive or not, and by the existing symptoms a diagnosis is reached. If the sensitive condition in apparently normal teeth ceases, it is safe to assume that erosion is not progressing, and if by massage we get a cessation of these symptoms, it is safe to conclude that the local expression is being arrested.

Dr. G. A. MAXFIELD, Holyoke, Mass. I was very much interested in the paper, and also somewhat disappointed. I want to refer to the portion of the paper dealing with therapeutics in daily practice. The writer said he wanted to specially emphasize this for the younger members of the profession. Now, I want to say a few words just for their benefit. Coming in contact with so many in the last ten years, I have been disappointed to find in them a lack of knowledge of therapeutics which every dentist should possess. In all of my questions on therapeutics probably not one-fourth of the candidates that come before the Massachusetts Board would pass if the questions on materia medica and therapeutics were the ones they were to be passed on. The essayist speaks of creasote being an excellent thing in daily practice. I agree with him, and do not think he can emphasize that too strongly. Yet what do I find in answer to questions on creasote? The applicant is asked to describe creasote, and to give its therapeutic val-

ues, and for answer to that I am told that it is seldom used today. I ask what ereasote is, and its uses in dental practice, and that is the answer I get. Now that comes from college graduates; and where do they get it? One student told me that his professor told him that it was a vile-smelling thing and should not be in any dental office. The professor who says that utters an untruth, and says what he ought not in teaching students. I ask the question, Is carbolic acid soluble in water? and ninety out of every hundred will say that it is freely soluble in water. I was talking last evening with a gentleman, and in speaking of sterilizing instruments, he said he kept a solution of forty per cent. carbolic acid on his bracket, and constantly dipped his instruments into it. Now, what I want to know is how to make a forty per cent. solution of carbolic acid. You cannot make a forty per cent. aqueous solution.

In regard to the treatment of root-canals, speaking of aristol for this purpose, I have gone back to the vile-smelling iodoform; and I did it because I get better results.

Dr. OTTOLENGUI. How do you use iodoform?

Dr. MAXFIELD. In solution with oil of eucalyptus. I know it is unpleasant to use, but the results justify it. When I go home at night my wife will say, "You have been using that vile-smelling iodoform again."

In regard to trichloroacetic acid, I have had excellent results with it in the treatment of pyorrhea.

Dr. GAYLORD. What strength?

Dr. MAXFIELD. I have used all strengths. I usually, however, employ a saturated solution. There are some mouths more sensitive to it than are

others, and in these cases I apply a little sodium bicarbonate solution, and that will immediately stop the burning sensation. Then again, in treating cases of pyorrhea, the last thing I do in the treatment is to use the compressed-air spray with a weak solution of carbolic acid. It relieves the soreness of the gums and produces a slight anesthetic effect, and the patient says, "How nice that feels."

In regard to long operations for fillings, etc., we must take into account the physical condition of the patient. Some patients can very easily stand the time it takes to make a beautiful gold filling, while others cannot, and in some of these latter cases the patient will not recover for a long time. We must consider that we are liable to cause a great deal of trouble from long operative procedures. The nervous strain on the heart, and also on the dental pulp, is to be considered. We very often have after-troubles with a dental pulp because of our rash treatment of the tooth.

Dr. O. T. RULE, Meriden, Conn. If college graduates give such answers as Dr. Maxfield says to questions in therapeutics, and if these men go to the right place to get their information, it is not a question of where they got their knowledge, but of where they forgot it.

In regard to therapeutics in daily practice, the essayist has certainly given us a broad definition of therapeutics—one which includes any means by which disease is stopped.

With regard to thoroughness, I think thoroughness is in a degree a relative term. I do not consider that thoroughness implies that we should always cut out every little speck where it is possible to catch the point of an explorer. For instance, if two patients, one of forty and the other of fifteen years, have several

places in the occlusal surfaces where the explorer will catch, it may be necessary to at once excavate such places in the case of the younger person, but entirely unnecessary in the case of the older one. This is due to the vast difference in density in different teeth. In approximal cavities that are very small I often advise a patient to wait three or six months, that such cavities may then be cut to the occlusal surface with less pain. I believe that the best way to fill approximal cavities is to extend them to the occlusal surfaces, but to do so in the case of very small cavities would cause considerable pain by reason of cutting through the intervening dentin.

The essayist, has spoken of leaving occlusal fillings with flat surfaces. The shape of the surface of an occlusal filling, whether flat or concave, I do not consider to be of the utmost importance as a therapeutic agent. We often find teeth that are worn down flat or very slightly concave, without cusps or sulci, and almost entirely free from caries. I have a pair of models of such a case which is the finest specimen of occlusion that has come to my notice. Why similar surfaces the result of the dentist's labors should not be as good as those produced by natural causes, I cannot see.

Dr. OTTOLENGUI. I was very glad to hear Dr. Maxfield admit that he used iodoform. It is a vile-smelling thing, and many object to its use, but iodoform is very valuable sometimes, and I get excellent results with it in cases which seem to resist every other mode of treatment. In this connection it may be interesting to you to know how I use the iodoform. I have it in a tightly corked bottle, put in a box, sealed, and put in the farthest corner of the office. When I want to use it I tell my assistant to

bring me the bottle. Just before using it I put some ether in the bottle and stir it. I then prepare the dressing, and carry it to the tooth as quickly as possible; the bottle is then returned to the corner and the instrument used is thrown out of the window. I do not have any odor of iodoform around the place, and, gentlemen, I want to say that I have used this medicament in that way in apparently unmanageable cases, and I have never had any future trouble.

Dr. F. L. FOSSUME, New York. I believe in the use of the rubber dam in washing the necks of sensitive teeth. In connection with the sodium bicarbonate, I use a forty per cent. solution of formaldehyd gas. I have not seen a case which has not been—I won't say permanently cured, because I do not know—but I have not yet seen a case that has not been relieved. This has been one of the greatest helps that I have ever had in overcoming these cases of erosion. The rubber dam must be used in treating the teeth in this way, because if it is not, the formalin will destroy the vital gingival margins and cause great pain. Great care should be taken in using it. It is not necessary to keep the preparation on the teeth very long; a couple of minutes will be sufficient.

Dr. MAXFIELD. Just one word in regard to why Dr. Ottolengui gets such good results from the use of the iodoform as he described. It is simply because of the penetrating powers of the ether in which he dissolves the iodoform. If he will use chloroform instead of ether, he will get still better results.

Dr. FREEMAN. In reference to the use of iodoform, I may state that I have used the same in my practice since 1883. The *modus operandi* is as follows: Make a saturated solution of iodo-

form in chloroform; take a drop-tube or syringe—I prefer the S. S. White platinum point drop-tube; place a few drops of the solution in the root-canal, then with a gutta-percha point pump this into the root-canal, thereby making an antiseptic gutta-percha solution in the root; follow the first gutta-percha point with another until the root-canal is entirely filled. I had occasion to open a few root-canals which were filled some time ago in this manner, and found a decided odor of iodoform. I read a paper in 1888 before the First District Dental Society of New York on the use of hydronaphthol and chloroform used in this manner.

Dr. FAUGHT (closing the discussion). Whenever I read a paper I have in mind the strong desire to endeavor to provoke discussion. I suppose an essayist should feel grateful if he is fairly torn into shreds, and feel that he has accomplished the purpose for which he read his paper—that is, to bring out differences and not similarity of views. I am nevertheless gratified at the discussion the paper has received and I am still further personally grateful to you for the very kindly attitude toward it. I recognize that in dealing with such a subject and presenting it in the way I have that I am treading on dangerous ground, particularly in closing the paper with a theory of what I felt was something and yet felt that I did not know what was in it. In studying these conditions I recognize fully that these three conditions, erosion, recession, and the rampant condition of decay in the oral cavity, are not diseases but are oral manifestations of disease. I recognize therefore that in systemic treatment we necessarily must go farther, perhaps, in order to be of benefit to our patients

than to change merely the conditions locally. We attempt in the mouth more or less to control the local conditions by means of local applications, therefore I do not see why we should not attempt to control in some measure the actual production of the glands. Now, whether the saliva should be acid or alkaline, or whether it should be neutral, is leading us into an exceedingly difficult course. From the experimentation that I have already made I cannot resist the feeling to go into it—recognizing the specific, so to speak, in medical practice. We think of malaria and we think of quinin; we think of syphilis and we think of mercury. We know that certain drugs are eliminated through certain organs, and we give drugs to act upon the different glands of the body to produce the conditions we desire. Why then should we not be able to extend that influence to the saliva? It is only a question of experimentation to find out how to attain it.

Going back to the other theme of the paper, that of thoroughness: One gentleman said he did not feel the need of cutting out every little rough place. I know, of course, that we have certain conditions which we know we can control where this is not absolutely necessary, but I believe that in any compromise with thoroughness we may find that we have waited too long. Very frequently in these little places that we can hardly detect, if we excavate with a bur it will be found that it drops into a larger cavity, which demonstrates to us how foolish it would be to compromise with thoroughness. One point I wish to emphasize relates to the use of new and sharp instruments on these young teeth. Have the instruments in such a condition that they will do the work quickly and

thoroughly; under these circumstances there is no difficulty in preparing a cavity and finishing the filling.

When we see the unfinished edges in fillings we must not always blame our fellow practitioner, because we do not understand the conditions; he is not always to be censured. I believe, however, that we must bring these fillings up to the true shape which nature intended they should have. There are many cases in which an operator may insert a filling where owing to pressure of time, and owing to the lack of time on the patient's part, or some imperative engagement, he may not have sufficient time to properly finish the filling. He

does not intend to leave the work in this condition, and he cautions the patient to return and have the filling finished, but time goes on and the patient overlooks the necessity of his returning to the dentist, and so we have operations in an unfinished condition that were never meant to be left that way.

On motion the subject was passed.

The next order of business was a paper by Dr. C. N. JOHNSON of Chicago, on "Differences in the Preparation of Cavities for Fillings and for Inlays," which in the absence of Dr. Johnson was read by Dr. R. Ottolengui of New York.

DIFFERENCES IN THE PREPARATION OF CAVITIES FOR FILLINGS AND FOR INLAYS.

By C. N. JOHNSON, L.D.S., D.D.S., Chicago, Ill.

THE introduction of inlay work as a means of saving the natural teeth, has furnished a new problem for the dentist to solve in the way of formulating a proper system of cavity preparation for this class of work. It cannot be expected that operators who have for years habituated themselves to the study of the principles involved in the preparation of cavities for fillings will be able immediately to readjust their point of view sufficiently to approach the preparation of cavities for inlays to the best advantage, and it is confidently believed that this is one of the reasons why inlays have not been more successful, even in the hands of those who have been most enthusiastic in their use.

It is the purpose of the present paper to point out some of the differences in the details of cavity preparation for fillings and for inlays, to be illustrated by cavities cut in tooth-forms of natural size, the one cavity for a filling, the other for an inlay. The aim is not so much to show cavities of typical or ideal form as it is to demonstrate the general differences in cavity formation for the two methods in similar locations. Neither is it claimed that in the minutiae the cavi-

ties here exhibited are perfect in outline or in principle. Teeth vary in form and in their manner of decay, and the problem must be met in each individual case according to the necessities presented.

The one distinctive feature to bear in mind always is that a cavity for a filling should be of such a form that the filling when inserted cannot be lifted out of it, while the requisite of a cavity for an inlay is that the completed inlay may be inserted and removed at will. The first thing for the inlay worker to learn is that the cavity must be widely extended at the orifice, and no man can successfully insert inlays without the will to freely sacrifice tooth tissue in many instances. The next thing to learn is that a mere saucer-shaped cavity with little depth relatively to its width cannot be depended on for the retention of inlays. The impression is too prevalent that the adhesive properties of cement are all sufficient for retaining inlays without appreciable penetration of the inlay, into the structure of the tooth. An inlay must have some body to it to remain securely seated in a cavity when subjected to stress, and it should so dip down into the tooth that it cannot be easily rocked

or tilted by pressure on either side even before any cement has been used to seal it. The lateral walls of the cavity cannot of course be undercut or even perfectly parallel, on account of the impossibility of removing a matrix fitted into such a cavity, and yet the walls should not be made to flare so widely from the base to the orifice as we frequently see them.

For fillings, we believe the best results are to be obtained by joining the walls of cavities with angles—for instance, the axial or pulpal wall should be joined to

axial and surrounding walls. From such a cavity a matrix for an inlay may be lifted without distortion, and yet it will be noted that provision is made for appreciable bulk to the inlay, and no thin margins such as would be present in a saucer-shaped cavity. The axial wall also presents a flat seat for the inlay to rest upon, although the area of the axial wall is not so great as the cavity at the marginal outline.

In the two approximal cavities in incisors where the incisal angle is involved,

FIG. 1.



FIG. 2.



the surrounding wall with a sharp right-angle—but for inlays the general plan must be one of curves. If angles are used at all they should be obtuse and not sharp, except in cases where the matrix may be lifted bodily away from the angle. It is the difference between the use in a cavity of an inverted cone bur and a round bur—between a hoe or hatchet excavator, and a spoon excavator.

In the labial cavities in central incisors herewith submitted for your inspection, you will notice that the one for a filling (Fig. 1) has a sharp right angle between the axial wall and the entire surrounding walls of the cavity, and that a filling properly adapted to such a cavity could not be dislodged short of breaking either the filling or the walls; while the one for an inlay (Fig. 2) has diverging walls with an obtuse angle between the

requiring a contour restoration, the one for a gold filling (Fig. 3) is prepared with decided angles in the gingival region—the gingival wall being carried somewhat labially and lingually, to widen it and produce a dovetailed effect. At the termination of the anchorage step there is also an angle with a slight depression rootwise, to form an interlocking of the filling. The labial plate of enamel is shortened somewhat on the incisal edge to admit of a small amount of gold being built over it for protection to the enamel. In the use of gold in these anterior teeth the exposure of the filling material becomes a matter of careful consideration, and in the protection of enamel it is often found that a thin layer of well-condensed gold is sufficient. This can never be said of porcelain, and while we are considering in a broad way the

preparation of cavities for gold inlays as well as porcelain, the call is almost universally for porcelain in these anterior teeth, and when that is used there can be left no thin edges for protection. Porcelain demands bulk for strength.

It will be seen that a filling adjusted to this cavity could not be removed short of breakage, and so it is not adapted to inlay work. There are two methods to be used in preparing such a cavity for an inlay: either to cut away the in-

all practical purposes, as has frequently been demonstrated in the mouth.

In the approximo-occlusal cavities in the bicuspid the one for a filling (Fig. 5) is marked by sharp angles between the axial and gingival walls, and also at the junction of the axial with the buccal and lingual walls. There is a sharp point-angle in the gingivo-axio-lingual and gingivo-axio-buccal regions, giving a distinct mortised or dove-tailed effect to the approximal portion

FIG. 3.



FIG. 4.



FIG. 5.

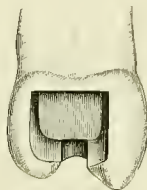
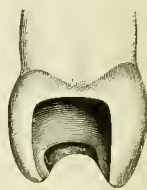


FIG. 6.



cisal portion of the labial as well as lingual plates of enamel, creating an L-shaped inlay reaching part way across the end of the tooth with appreciable thickness of porcelain at this point, or else to prepare the cavity as indicated in the model (Fig. 4), by leaving the labial wall standing to the extreme incisal end, and cutting away the lingual very freely to arrange for bulk to the porcelain in this region. It may be argued that this form of preparation provides little retention to the inlay from dislodgment under pressure toward the lingual, but most of the ordinary stress against such an inlay comes from the lingual toward the labial, and it would be difficult to dislodge the inlay in this direction. Not only this, but an inlay set in such a cavity under pressure, with a good cement which does not shrink, will stand considerable stress toward the lingual—enough at least for

of the cavity. In the anchorage step in the occlusal portion, the floor is perfectly flat, with an angle between it and the surrounding walls of the step. The step terminates in an abrupt perpendicular wall, while the width of the step bucco-lingually at this point is greater than it is midway between the cusps. All of these interlocking forms are advantageous in the retention of a filling and tend to its most secure anchorage, but an inlay would be altogether unmanageable in such a cavity.

It will be noticed that the cavity for the inlay (Fig. 6) in the other bicuspid has been extended very much wider bucco-lingually at the occlusal surface than the one for the filling, and the general scheme of angles has been abandoned. The walls join each other on short curves rather than angles, and the cavity, while quite deep, is of such a form that a matrix for an inlay could be

fitted to it and removed without distortion.

These are the chief differences to be noted in preparing cavities for fillings and for inlays in the three classes of cavities illustrated, and they embody in a general way the differences in all classes. There are other distinctions in some of the minor details which will be readily apparent to every operator, such for instance as the greater liberty

in beveling and overlapping thin enamel where gold inlays are used than for fillings. Melted gold of 18- or 20-karat will be stronger to given bulk than a malleted filling, and it can be beveled to thinner margins with greater safety.

But in these details each operator's judgment must suffice. It is only with the broad question of general cavity formation in a few of the different classes that the present paper has to deal.

DISCUSSION.

Dr. M. L. RHEIN, New York. The subject of Dr. Johnson's paper is unquestionably one of those timely ones that is particularly appropriate since porcelain inlays have come into such general use during the past few years. After listening to Dr. Johnson's paper I surmise, especially since I have examined the specimens, that he is comparing the preparation of inlays with gold fillings. He speaks of gold fillings in certain portions of the paper, but he does not say that he is comparing the two specifically at the outset. In his absence I do not think it is safe to conclude that he has reference to any other form of filling, inasmuch as there would be a wide latitude in the discussion if we considered all the different forms of fillings, because the preparation of a cavity for an amalgam filling and that for a gold filling have essential differences to be considered. Therefore I judge that he is simply comparing the differences between porcelain inlays and gold fillings.

It is very difficult, after listening to the short though accurate differentiation

that he has made, to have any valid differences with the author. From the manner in which he has presented the paper and in which he has prepared the specimens, it is unquestionably necessary for the dentist of today to carefully differentiate as to how to care for the different cavities, whether to insert gold fillings or porcelain inlays, for the reasons that he has so tersely presented to us. It is incumbent upon us for the successful insertion of an inlay that we depart from some of the methods that we have learned are so essential to the success of the gold filling. While I am not in absolute accord with the essayist on some of the essential details of his preparation of the gold filling and the porcelain inlay, in the main I thoroughly coincide with him.

I differ a little with him in that he seems to leave us too uncertain as to the thickness of the bulk we are capable of leaving in a gold filling to insure sufficient strength on the grinding marginal surfaces. Now, it is an important factor in the insertion of a gold filling in these

places that the operator should accurately judge before inserting the filling and before preparing the cavity as to how much stress and strain that particular tooth is going to have on the grinding surface. In a large number of cases where there is a great amount of masticatory force brought into play, a thin surface of gold will prove but a temporary result where a permanent one has been expected. Some people who use great force in masticating will wear away the gold surface with great rapidity, and I especially desire to call attention to this particular point, that in such cases where gold has been decided upon it is necessary to cut away sufficient of the grinding surface of the tooth so that there will be sufficient bulk of gold to stand a given amount of stress. This I consider one of the most important points brought out in the paper.

While I agree with the essayist that a great many failures are due to the attempt to put in too thin inlays and rely upon the adhesive quality of the cement, still there is a difference in the strain that certain forms of porcelain will endure. We fail to find the strength in the high-fusing porcelain for this purpose that we get from the homogeneous quality of Dr. Jenkins' body. It is one of the strong points in favor of the Jenkins body as an inlay, that in the same amount of surface, where used on the grinding surface, it will stand the strain infinitely better than the high-fusing. This is due entirely to the fact that it is a homogeneous mass when it is thoroughly fluxed.

Exception must be taken to the view that we cannot have undercuts in porcelain inlays. As a general principle his premises are correct, but like every other

principle laid down there are vital exceptions to it, and they come into play in those cases where we must have undercuts for placing our fillings so that our patients will not bring them back to us in their hands. It is possible to use undercuts in the preparation of cavities for porcelain inlays, and yet have the matrix in such a form that it can be removed without impairment of the perfection of that matrix. It can be done by finely shaping the cavity, as Dr. Ottolengui has beautifully shown. A perfect undercut can be made in a cavity like those of the bicuspid that have been passed around; the undercut can be brought up at a right angle from the floor of the cavity to the occlusal edge, and the matrix removed from the occlusal opening, the cavity being flared sufficiently to produce the necessary V shape.

The secret of success in the insertion of inlays is in a great many instances due to the fact that one side of the inlay is so flatly shaped that when the inlay is cemented into position it will be in its proper place. In certain classes of cavities, especially labial cavities, it is important that the inlay should be so shaped that the exact position in which it is to be placed in the cavity is readily distinguishable by the operator, and the cavity should be so prepared that the operator knows that his inlay is going into the place for which it was intended. Now this may seem to many of you an unnecessary remark, but all practitioners who have had much experience with the round bur-shaped inlays in labial cavities will realize how difficult it is at times to know just which part of that inlay fits the corresponding part of the cavity. At the corners of teeth I have seen men insert an especially beautiful

inlay, one that fitted perfectly, and after it was cemented into place it was nothing but an eyesore, because the operator had not taken the precaution or did not realize that it was necessary to obtain the absolutely accurate adaptation of the inlay to the tooth when it was being cemented into place.

Gold fillings and porcelain inlays each have their place, and porcelain inlays will never, so far as we can see at the present day, take the place that the gold filling properly fills. It is a wise thing for the older men to throw out a little caution to the younger practitioners not to be led away by the wild enthusiasm of the extremist in porcelain, and not to be in a hurry to relegate their gold pluggers to the junk heap. As far as we have at present developed we cannot get along without gold fillings in some places. I am a great believer in porcelain from the esthetic standpoint, where the filling is going to show, and I would rather replace a porcelain filling, if necessary, than to have a gold filling obtruding itself upon the sight of the public, but the experimental stage of porcelain in the distal portions of the mouth is altogether of too recent a date for us to dare assert that it ranks with gold as a permanent operation. I recognize the fact that this is a little foreign to the subject, but I think it pertinent to be introduced into the discussion at this time.

Dr. JOSEPH HEAD, Philadelphia. It is true, as Dr. Johnson says, that his gold filling would have to be so shaped or constructed that the tooth would break before it would come out. The same thing applies to porcelain fillings; either the porcelain or the cement has to break, and the thing for us to do is to make these porcelain inlays so that the

porcelain will break first; get enough body to the cement to hold the inlay. This can best be done by making undercuts.

Among my experiments*—I will not trouble you by giving the figures—I came across a very interesting fact, namely, that old cement when carefully cut and dried would give an adhesion with new cement much stronger than the cement would make with the porcelain inlay or the etched inlay. The adhesion was simply tremendous. With that factor in our minds, what is the difficulty—when we consider the statement of Dr. Johnson that in order to properly prepare a cavity for a porcelain filling we are obliged to sacrifice much tooth-structure, so as to have every cavity shaped for easy removal of the matrix—what is the difficulty in filling the cavity first with cement, then cutting it out and making a perfectly simple cavity with clean enamel margins? That being done, we can make a simple matrix on perfectly clear enamel margins, make the inlay, undercut well and also with deep grooves in the old cement. I cannot see any more sacrifice of tooth-structure in this way than in originally shaping the cavity so that the matrix can be easily removed. There seems to be an impression that it is necessary to shape the cavity the way it is going to be when finished—that we have to form the cavity exactly on the lines we want the inlay to occupy. Why not prepare them so as to get this adhesion of the old cement? Make them so that the cement will act as dowels; use plenty of cement body to your inlay. Dr. Johnson's statements concerning the necessity for vital differences in the ultimate shapes of the

* See *Cosmos* for July 1905, p. 779.

cavities for an inlay and for a gold filling does not seem to be borne out by my experience.

Dr. RHEIN. I want to make a little correction, or rather an addition, to my previous remarks lest they may be misinterpreted. What I said as to the advantage of making undercuts on bicuspid in the manner I described referred to undercuts which we could utilize in the contour of the inlay itself. I want to add that before inserting the inlay the final preparation should of necessity include a most thorough undercutting of the cavity for the retention of the filling by the bulk of cement, and this, I am almost positive, has been unintentionally omitted on the part of the essayist—in that he refers in the preparation of the cavity simply to the form of the cavity to make the necessary form of matrix, and not as to the shape he intends to have when the inlay is inserted into position. I also want to say that I see no necessity for making this undercut preparation before the matrix is made, but I see great advantage in delaying it until after we have a perfectly fitting inlay to place in position. We can then remove all of the interior of the tooth that we want, so as to obtain sufficient bulk of cement to retain the inlay properly.

Dr. C. S. HARDY, Summit, N. J. I quite approve of the remarks Dr. Head made in regard to the adhesiveness of the new and the old cement, and also Dr. Ottolengui's method of getting an undercut which Dr. Rhein has mentioned. That is something I always do when possible in putting a filling in the approximal surfaces of the bicuspid and molars. In regard to the preparation of the cavity before taking the impression, there is one point that I would like to

bring out which I think no one has mentioned, viz, in an approximal filling I find that a great many impressions are taken without smoothing off the surfaces of the tooth, and little portions of the edge of the filling are found to project over the edge of the cavity. These break off when an attempt is made to cement the filling in place, leaving an imperfect margin to the filling. By taking a disk and making the surface of the tooth smooth, a much better and truer edge for the filling is secured.

Dr. C. C. PATTEN, Boston, Mass. My work is along the same line as that of Dr. Head, although there is easily a chance for argument between Dr. Head and myself. Inlay work as I have looked upon it is to a great extent very similar to inlay work as done by woodworkers. One of the principles in applying inlay work to woodworking is to get a good joint and then exclude as much of the cementing medium as possible. It has been my practice to have as little bulk of cement between the porcelain and the tooth-structure as possible, by securing well-adapted porcelain and then by pressure holding it in place until the proper time for the cement to set. In many cases it is desirable to fill the cavity with cement and then reshape the cavity before securing the matrix; after that a certain amount can be removed. The formation of the cavity has to be governed by the conditions that confront the operator, and whatever principles are adopted it is sometimes necessary to depart from them. All these ideas brought out in discussions of this kind will aid us in our work.

While I started out very enthusiastic over porcelain, and while I still have a large amount of that enthusiasm, I am inclined as the years go by to be more

conservative in the application of porcelain for fillings. Some cases where I felt reasonably justified in expecting good results were somewhat disappointing, not because the principles involved were wrong, but because of misplaced judgment on my part. Properly used, there is no combination of filling materials that will so well stop the ravages of decay and restore the harmonious appearance of the tooth-structure as will a combination of cement and porcelain well worked.

Dr. S. C. G. WATKINS, Monclair, N. J. That idea of undercutting in the approximal grinding surfaces of bicuspid in order to slip the porcelain filling in as a dowel is a magnificent idea. I have practiced the undercutting as described by Dr. Head, but the other idea is a new one to me, and I was very glad indeed to hear it.

I have seen very few porcelain fillings that seemed like perfect fillings. Of course there are a great many of them inserted, but I do not know what becomes of them; they do not come under my observation. I did, however, put in one yesterday that was very satisfactory, and I told Dr. Gaylord that I would like to have had that one here to show you, as I never expected to insert another as good. When I went into porcelain I said I was going into it to do the work right if I could, and I was very much interested in Dr. Faught's paper because he described his methods of working in that thorough manner which must carry with it success. If the methods he described are carried into porcelain work, if a man will go into it with the idea of succeeding or dying in the act, he will succeed, but there are so many who enter upon the work in the manner described to me by a gentleman last night who said he was

in the habit of making a matrix for a porcelain inlay in from six to eight minutes, and baking the fillings in from six to seven minutes. I could well imagine the kind of work he did. I do not know how long it takes others to do it, but it takes me a great deal longer than that. It is this thoroughness and stick-to-it-iveness that we must have in order to do work that is satisfactory.

Dr. J. H. HANNING, Brooklyn. At nearly every meeting we hear references made to the woodworking of the carpenter compared to the inlay work of dentistry. There is no similarity between glue and zinc oxyphosphate, nor is there any similarity between enamel and dentin, or oak and hickory. No matter how thin a film of glue, still a good adhesion between two pieces of wood can be obtained because of the cementing medium penetrating the substances to be held together. Now, if we were to set inlays with glue and had the inlay and tooth-structure as dry afterward as the wood is, and could have the cementing medium penetrate the tissues, we would have as good a joint as in the ease of the wood, but a thin film of cement, under conditions we have to meet in the mouth, will give little or no strength. I think one of the vital points in inlay work is to get sufficient bulk of cement in the cavity to hold the inlay, and I think the essayist is correct in this statement.

I believe, as many here believe, that the cavity should be shaped in such a way that if possible a dovetail shape is secured, and one from which the matrix may be easily removed, and when the inlay is placed in position it should be dovetailed against the line of stress.

Dr. OTTOLENGUI (closing the discussion). Ordinarily, while to read a man's paper is easy enough, yet to close the

discussion of any paper would be an entirely different matter; but to close the discussion on this paper is quite easy. I am sure that the gentlemen who have differed with Dr. Johnson would not have an inch of ground to stand on if he were here, and I do not think they will have more than an inch and a half as it is. Now, in the first place I really feel sorry for Drs. Head and Rhein because each has discussed a paper and differed with the author without first having read the paper. I am sure that when they read the paper they will wish that they had not differed with him.

I know that in closing this discussion I am likely to be looked upon as appearing in a dual capacity—first to defend, and then to take exceptions to some things in the paper. In other words, the moral is, Never read a paper of another man and discuss it too. However, there is no point in the paper which admits of any discussion whatever. The thing is an absolute finality. Why? Because Dr. Johnson knew he was not going to be here and he was very careful not to say anything that was not absolutely correct. He has only laid down the A B C of this work and given you the fundamental differences between the preparation of a cavity for gold and the preparation of a cavity for porcelain, and these differences must be made. Whether or not before he puts the inlay into the cavity he changes the shape of the cavity is another question, but what Dr. Johnson stated was, that it was necessary to follow one form of preparation for gold and another for porcelain.

Dr. HEAD. Why does he necessarily have to change the shape in one and not in the other? The difference lies in the fact that in one the filling is shaped in

advance of insertion, and in the other the preparation is such that in the finished filling we do not need to change the shape.

Dr. OTTOLENGUI. Dr. Johnson said the fundamental difference between the two was that the cavity preparation for gold had to be such that the gold could not be removed from the cavity without breaking either the tooth or the gold, but that the cavity preparation for porcelain has to be such that after making the porcelain inlay it could be put in whole and taken out whole.

Dr. HEAD. After the inlay is inserted for good it cannot be removed without breaking either the inlay or the cement. Does he not mean that?

Dr. OTTOLENGUI. He said insert and remove, which proves that he did not mean that.

Dr. HEAD. It is not what he says, but what the paper means.

Dr. OTTOLENGUI. The paper means that the fundamental differences of the preparation for the two cavities is that the cavity for gold is so shaped that the gold cannot be removed after it has been placed in position without altering the shape of the cavity or the gold, and conversely, that the preparation for an inlay has to be such that we can place it in whole and take it out again without altering the shape of either the cavity or the porcelain filling.

Dr. HEAD. You cannot, because the porcelain filling is composed of porcelain and cement. I would like to ask you if Dr. Johnson did not mean in this work that he finally shapes these cavities differently after the finishing of the inlay, although he did not mention undercutting.

Dr. OTTOLENGUI. I will come to that later.

Dr. HEAD. He does not speak of undercutting in his paper, but he evidently means that. Anybody who has done much inlay work knows that, or will learn it.

Dr. OTTOLENGUI. I have not learned it.

Dr. HEAD. You will learn it, after you have had enough failures.

Dr. OTTOLENGUI. Oh, well, provided your fillings fail. I have not learned that yet, and I guess I have put in more than three thousand inlays.

Dr. HEAD. Then probably you have never had any failures in inlay work?

Dr. OTTOLENGUI. Now, that is getting too personal. Dr. Rhein spoke about undercuts, and he pointed out that I had originated a formation of cavity with undercuts, and that Dr. Johnson now says that we must not have undercuts. He did not mean no undercuts, but he meant undercuts of that character which so hold the inlay in that it cannot be removed. He gave in his example two styles of undercutting for the retention of gold, and he departed from that in the retention of porcelain fillings, and in both cases you see what he means. In one you have a labial cavity in which there is a slight flaring at the axial wall, and in the other an undercut completely around the circumferences. Now, when we come to the bicuspid, he pointed out in a beautiful manner that where there is an approximal cavity in bicuspids for gold which comes up to the outer occlusal surface, and in which there is an initial wedge-shape approximal cavity, the larger edge of the wedge should be pointed toward the gingival border, being narrow reversely, and the widening of the side inwardly. Then he points out the lines, reverse to this, for inlay preparation.

Dr. RHEIN. I want to ask Dr. Otto-
lengui if it was not an error of omission on the part of the author that he left the cavities without allusion to the final condition prior to the insertion of the inlay. I believe it was an error of omission, but if not it really should be corrected. I realized after listening to the paper that it was rather hurriedly written, and it is very easy under those conditions to omit a point of this nature.

Dr. OTTOLENGUI. He does not change the shape of the cavity, but when the inlay is finished it is inserted into the tooth. Dr. Head's experiments proved conclusively that the original recommendation of Dr. Jenkins, that the nearer an inlay was made and inserted in the shape of a collar button, the more securely it would be fixed in position. I never knew what undercuts meant until I saw Dr. Jenkins make one, and in presenting this in a paper I conceived the thought of conveying the idea of the undercut by saying that it was shaped like a collar button. Dr. Head's experiments have proved that that is the best way to hold them in. In these cases you see, though, that the undercut is in the inlay, and not in the cavity.

Dr. HEAD. I do not agree with you in that. In all of my experiments the cement left the ivory and stuck to the porcelain.

Dr. OTTOLENGUI. When your porcelain was not undercut?

Dr. HEAD. Yes.

Dr. OTTOLENGUI. In your first experiments, when the inlays were unetched, when the inlays were forced out, was the cement on the inlay or in the bottom of the cavity?

Dr. HEAD. There was not much appreciable difference. There was some on each, but whenever the inlays were

etched there was a much stronger adhesion.

May I ask one more question? Do you, speaking for Dr. Johnson, in the light of what has been brought out, think that the preparation of a cavity for a porcelain inlay requires more destruction of the tooth-structure than does the preparation for gold? I am speaking of enlarging the opening.

Dr. OTTOLENGUI. Dr. Johnson said that no one could be a successful porcelain operator who would be afraid to cut away tooth-structure. Now, as a matter of fact, we will let Dr. Rhein prepare a cavity for gold, cut it as much as it is necessary, but not having in mind porcelain, and when he has finished this preparation have the patient tell him he had decided to have porcelain there, and he will then have to cut it some more—that is all that Dr. Johnson means.

Dr. RHEIN. Except in the change of the preparation of the margins I do not agree with you. I do not agree with your interpretation that this applies to cavities prepared with the wedge-shape effect.

Dr. OTTOLENGUI. I want to say, gentlemen, that there is no question about this difference. There is this objection that I make to the special preparations for cavities, that they are to a certain extent ideal. They are started in sound teeth, and in that way we can work to a certain formation. I have seen beautiful specimens of cavity preparation from the West, with those beautiful little square steps in them; I have also seen many teeth so decayed that you could not put a step in them to save your life, and these teeth are the ones in which we have to cut away more structure to put in porcelain. The only way to prepare these cavities for porcelain is to do one

of two things—cut away the tooth-substance, or reduce the size of the cavity with zinc oxyphosphate, as Dr. Head suggested. I still believe, however, that the less oxyphosphate we have in a tooth the better, because the crushing strength of oxyphosphate is not as great as the crushing strength of porcelain, and so I believe, in those teeth where we are simply compelled to put in a bulk of oxyphosphate, we must prepare the cavity so that the porcelain will rest on ledges in the tooth, and not on the oxyphosphate, so that the pressure will be on the porcelain and not on the oxyphosphate.

Dr. Johnson knows, and I may add that I also know, that there are many cases where the shape of the cavity must be changed after the preparation of the matrix. Now, whenever this has to be done, it is because for one reason or another the cavity cannot be shaped at the outset as one would desire.

Dr. Rhein said that Dr. Johnson's cavity preparation shows very square sides, and then Dr. Rhein said we should always have a flat side. If by the flat side Dr. Rhein means the side labiolingually, I stand ready to agree with him, but if he means that it should be the side which is at right angles to the axial wall I do not agree with him. I would a great deal rather in all corner preparations have a definite angle in that side. I would prepare it flat first, and then put a groove in afterward.

Dr. RHEIN. I have reference to that flatness of the side by which, when you place the inlay in the cavity, you are sure that it is in the right place.

Dr. P. B. McCULLOUGH, Philadelphia. Dr. Rhein has overlooked the importance of making undercuts in the tooth. I would like to know whether it is his rule

always to make undercuts in the teeth, and also in the porcelain inlay.

Dr. RHEIN. That depends entirely on the cavity. I have no absolute rule, but I always put undercuts in the cavity before the filling is permanently inserted. My form of preparation of the cavity is also dependent upon circumstances and conditions. I always etch all porcelain inlays, and in addition to that I give the porcelain an undercut in the manner outlined by Dr. Ottolengui.

Dr. McCULLOUGH. In a simple cavity on an incisor where the filling is to stand little stress, do you undercut that?

Dr. RHEIN. I always undercut the cavity. I prepare my cavities in line with the cavity preparation of Dr. Johnson, and before inserting the inlay, in order to increase the resistance against masticating force and the possibility of displacement, I undercut the cavity as thoroughly as I would for gold.

Dr. McCULLOUGH. You say you make a deep undercut in the labial face of a central incisor in order to increase the resistance against displacement. Suppose the labial side is thin and very frail; that is, where you are inserting a corner filling.

Dr. RHEIN. The corner of an incisor, if properly prepared, is much more secure, frequently, than what appears to be a simple labial filling. They are the most satisfactory fillings with which I have to do.

Dr. McCULLOUGH. What about a ease where the mechanical action does not involve that part of the tooth under stress?

Dr. RHEIN. There is always some stress. There is stress of mastication, and there is stress of the opposing teeth striking against each other. In preparing these corners they should be ground

so that the stress of mastication will not interfere with the corner; and the cavity preparation should be such that the stress of the lower incisors striking against the upper incisor cannot be sufficient to displace the inlay.

Dr. McCULLOUGH. The point I wanted to bring out had reference to cases in the labial incisors where there is very little stress and we have a very small bulk of porcelain in the cavity. When we try to cut a groove around that, we find that the amount of porcelain is so very small that we cannot make a groove in it.

Dr. RHEIN. I would not undercut an inlay of that kind, I would simply etch it.

Dr. McCULLOUGH. I have been attending dental society meetings for fifteen years, and I never saw the discussion of a serious question take such a humorous turn as has this. According to Dr. Ottolengui, we have in the presentation by Dr. Johnson of the A B C of porcelain work an exposition of the highest point of perfection that it is in the power of the human mind to conceive. Dr. Ottolengui states that what he has presented here is simply beyond fallibility, and we have found for the first time perfection in a man from Chicago.

Dr. OTTOLENGUI. I want to say that when I said Dr. Johnson, not being here to defend himself, only wanted to present what was absolutely correct, the A B C of this work, the fundamental principles of porcelain work, I meant it not humorously but seriously. There is very little in the paper indeed, and nothing to warrant extravagant language such as the gentleman has just used. What the essayist has said is irrefutable, as much so as the statement that we must clean

our teeth. Dr. Johnson has simply enumerated a few principles, and I repeat that these principles are indisputable.

There being no further business before the society, the subject was passed and motion was made and carried to adjourn until the evening session.

TUESDAY—Evening Session.

The evening session was called to order at 8 o'clock by the president, Dr. D. W. Johnston.

The first order of business for the evening session was the reading of a

paper by Dr. M. L. RHEIN of New York, on "The Technique of Pulp-Removal and Root-Treatment Associated Therewith."

The paper was as follows:

THE TECHNIQUE OF PULP-REMOVAL AND ROOT-TREATMENT ASSOCIATED THEREWITH.

By M. L. RHEIN, M.D., D.D.S., New York, N. Y.

THE evolution of dental science during the past twenty-five years has wrought many changes in the technique of pulp-removal and its associate operations and treatment. Dental chemistry has rescued this important field from the plane of empiricism and placed it on a level with the other scientific work of our profession. This is the one field of our labor that is not absolutely open to visual inspection, and this accounts to a large extent for the reluctance and fear with which the work is generally undertaken.

The majority of the profession have had such a large percentage of failures that one might suppose they would seize with avidity upon all scientific advancements in this field of operative procedure. Unfortunately this is not the case. What need of success the average man possesses, he soon discovers to be due to painstaking and thorough work followed along well-defined paths, and he fears in consequence the slightest departure from his accustomed lines of procedure. As a result of such conditions the major portion of the profession today practice

methods but little removed from empiricism.

Our studies of minute anatomy and pathology have taught us the necessity of the aseptic removal of all organic tissue contained in the pulp-chamber and the root-canals, and as much as possible from the canaliculi. These openings are then to be hermetically sealed in an aseptic manner so as to prevent the ingress of any micro-organisms. The accomplishment of this result is an absolute necessity in order to insure a successful operation.

In straight single-rooted teeth such results are easily attained, but as we diverge from these to more irregular forms of multi-rooted teeth with their variations in shape and size not only of the root itself, but of the area of the canal in which the pulp tissue is contained, we are beset by greater difficulties. It may be stated at the outset that with the aid which chemistry has furnished us, there remain but a very few of the most irregular types of roots which cannot be thoroughly cleansed of their pulp-contents. There are many scientific ways at the present date by means of which this

important labor can be properly accomplished.

In presenting one of these methods for your consideration, I do so with the confidence begotten of thirteen years' successful practice in the entirety of this technique, and a portion of it extending back a period of over twenty years. It was about the year 1884 that I ceased using carbolic acid or creasote in any form in root-canal work, because I was opposed to the preserving of organic tissues which at some future date would tend to discolor the tooth-substance even if it did not become the prey of bacterial infection. The simple technique which I have the honor of presenting to you has resulted from a gradual evolution based on the principle which I have previously enunciated of the absolute removal of all organic contents.

As in all operations where infection plays a prominent rôle, it is necessary to use every available aseptic precaution. The hands of the operator should be as clean and as nearly sterile as possible; the operating table should be in the same condition; the hands of the assistant should be in a like condition; all instruments that are used should be previously sterilized and polished. In fact, all the precautions of the surgical operating room should be employed. In this respect, it is essential that no work should be done upon the tooth until the rubber dam has been applied. This should be an invariable rule in any work involving pulp or canal treatment at any period.

It is essential to separate into two divisions the removal of pulps, those that may be living and those that are dead.

REMOVAL OF LIVING PULPS.

The removal of a living pulp is generally accomplished by one of two methods,

the application of arsenous acid, or the anesthetizing the pulp with cocain hydrochlorid. The use of arsenous acid has become so nearly obsolete, recourse being had to it only in such cases where for some reason or other cocainization is an impossibility, that on account of lack of time it will not be considered in this communication.

It is not the purpose of this paper to enter into the detail of the different methods of reaching the pulp, and of the technique of pressure anesthesia, except to say that after a pulp has been exposed it is necessary to use due precaution in the use of pressure anesthesia to avoid two things. First, to guard against the danger of forcing micro-organisms with the anesthetic through the end of the root, or sometimes through the approximal sides of the tooth into the soft tissues. Second, every precaution should be taken not to force the anesthetic itself so far that it would pass the confines of the end of the root. Under such conditions a much more favorable outlook for the comfort of the patient can be guaranteed for the next few days than where the anesthetic has been carried well up into the periapical region.

It is a common error to use pressure against the cocain solution for too long a time. In case a portion of one of the walls is missing, it is replaced artificially by use of soft stopping, gutta-percha, or unvulcanized rubber, so that the pressure of the rubber can be made directly against the pulp without danger of the fluid finding an outlet in some other direction. Under such conditions an application of pressure lasting only from five to twenty seconds will produce profound anesthesia of the entire contents of the pulp-canals; while the prolongation of pressure brings with it the lia-

bility of forcing the medicament through the foramina.

In all cases of pulp-removal the first essential is to outline the amount of opening that is necessary in order to give direct access to the orifice of each root-canal. This necessitates the free cutting away of every portion of the tooth-substance that may interfere with the accomplishment of this object. This should be done at the outset, as it serves to make the pulp-chamber more accessible and to simplify all following operative procedure. There is no excuse for violating this fundamental principle, and yet this is where a great many make their first blunder. Failure to freely expose the orifice of each canal makes it a physical impossibility to thoroughly remove its contents. Conserving of a small amount of tooth-structure is of little value if it is to be followed by an alveolar abscess.

In the posterior teeth the free opening of the pulp-chamber with a fissure bur generally results in the removal of most of the contents of the pulp-chamber. If this has been properly done, we now have exposed to view the orifices of the different canals. A Donaldson pulp-canal cleanser of the right size is now selected, care being taken to carefully inspect it with a magnifying glass for any possible flaws that may exist where the barbs are cut. There being no question of the absolute sterility of this broach, it is now delicately passed up the side of the canal, and after it has proceeded as far as possible the broach is turned around with the greatest delicacy in order to twist the fibers of the pulp around the barbs. This twisting movement is persisted in until the broach is supposed to have reached the end of the canal, when with the same regard to delicacy of manipulation it is

withdrawn, and should have the pulp wrapped around it.

There is a great variation in the ease and thoroughness with which the pulp in different canals can be removed on the first attempt. Any difficulty of removal is dependent on two conditions, the vitality of the patient and the presence of nodular masses in the pulp tissue. Under such disadvantageous conditions it frequently happens that the pulps in the different canals will have to be removed in different sections. Having reached the stage of instrumentation where it seems impossible to bring away any more pulp tissue, this method of procedure is abandoned, and recourse is had to chemical means for the purpose of disintegrating and destroying whatever organic tissue remains between the pulp-chamber and the end of the root.

REMOVAL OF DEAD PULPS.

Reverting now to the other class of cases, where the pulps are dead, the procedure so far as opening up the cavity is concerned varies but little from what has been above outlined. The important point to remember in such cases is the danger of forcing infected pulp-débris through the end of the root, consequently it is important to bathe the interior of the pulp-chamber with a 10 per cent. solution of formaldehyd before instrumentation is begun. The mechanical removal of the pulp-contents in these cases is dependent upon how long vitality has ceased to exist in the pulp tissue, and into what condition it has degenerated. This may vary from the form where there still remains a tangible mass of pulp to wind around a Donaldson cleanser, to those cases where the canal is simply filled with a mass of putrescent liquid.

Having emptied the canals of their

contents by instrumentation as far as possible, we find ourselves at the same stage where we left off with the removal of living pulp tissue. Whatever chemical means are now used to remove all remaining portions of organic matter, and as much of the fibrils that enter the tubuli as possible, one important point must be kept in mind, viz, that all coagulating media should be avoided until the process of disintegration has been thoroughly completed, otherwise encystment of portions of the organic matter will surely take place, to be followed in turn by more or less discoloration of the tooth-substance.

There are two chemical compounds that stand pre-eminent at the present day for the radical accomplishment of this purpose. Both were introduced into this country the same year, and their action is very similar. Sodium dioxid was introduced by Dr. E. C. Kirk in 1893, and in the same year at the Columbian Dental Congress, Dr. Emil Schreier of Vienna introduced to the profession the alloy of sodium-potassium (kalium-natrium). Sodium dioxid has the advantage when it is decomposed of combining not only with the putrescent masses in the pulp and disintegrating whatever organic products may be present, but at the same time it also sets free ozonized oxygen which oxidizes whatever coloring matter may exist. It requires, however, a great deal more care in its use, and is much more difficult to manipulate than the sodium and potassium mixture. This latter preparation was originally introduced by Dr. Schreier with the sole idea of saponifying the fats and other organic tissues and then leaving what is considered this harmless matter in the canals. This is not the form of technique I desire to call your attention to in advo-

cating, as I do, the use of kalium-natrium.

A barbed Donaldson bristle is passed through the paraffin into the sodium-potassium and with a small amount of the latter clinging to the barbs, it is now gently passed into the pulp-canals. The water which is present is at once acted upon, forming sodium and potassium hydroxid, liberating the hydrogen, which gas can be seen escaping. The caustic alkalis in their turn act upon the fats, and the result is a sodium and potassium soap, with glycerin as a by-product. These substances are freely soluble and easily washed out of the canals. The latter process, however, should not be undertaken until all portions either of living organic tissue or decomposed putrescent tissue have been saponified. This stage is determined by the fact that the characteristic bubbling of the sodium and potassium when it comes into contact with either living or putrescent matter has stopped, and the chemical compound rests perfectly inert in the root-canals.

This alloy not only decomposes and disorganizes the tissue that exists in the canals, but in the act of doing so it bores its own passage through the fine and inaccessible canals such as the buccal canals of the upper molars and the mesial canals of lower molars. Its ability in this respect for finding the end of the most tortuous canal is limited only by the skill and patience with which it is used by the operator. When it no longer finds any fibrils in the tubuli to act on, it will cease to give forth its peculiar hissing sound.

The next step is to wash out the soapy mass and any pigments that may be contained therein in order to prevent subsequent discoloration of the tooth-structure. For this purpose I used hydrogen

dioxid, which takes the place of the ozonized oxygen set free when sodium dioxid is the agent used. Instead, however, of using simply hydrogen dioxid, I have hit upon the expedient of dissolving in it the most reliable germicide at our command, mercury bichlorid. For this purpose I have found the only available hydrogen-dioxid preparation to be that of Marchand. I keep ready prepared for this purpose a solution of 1 part of HgCl_2 to 500 of H_2O_2 .

The canals are now thoroughly washed out with this solution, using a glass hypodermic syringe with platinum needles. The oxygen that is set free oxidizes all coloring matter that may remain in the tooth-structure, and on the evaporation of the solution a minute amount of the mercuric chlorid residue is left in the dental tubuli, remaining there as a permanent germicide. The canals are now thoroughly dried. A little sterile cotton or paper is placed in the pulp-chamber, the cavity is sealed with gutta-percha, and the patient is dismissed.

If, on account of lack of time, all the organic tissue has not been saponified at the first sitting, the cavity should be dried and sealed with gutta-percha without washing out the canals with the bichlorid solution. This is recommended in order to avoid coagulating any tissue which could later be disintegrated and washed out. Should some sensitive tissue remain in the canals, a dressing of one of the essential oils should be left under the stopping to obtain the benefit of its anodyne effect.

Upon the patient's return at a subsequent sitting the gutta-percha is removed, and if there be any question as to any organic matter remaining at the ends of the root-canals, the sodium and potassium paste is again applied and fol-

lowed with the wash of HgCl_2 and H_2O_2 . The canals are then thoroughly dried with heated air, a few wisps of cotton are wound around a Swiss broach, and this is dipped in the oil of eucalyptus and passed to the ends of the dried canals. The canals are again dried with heated air, which forces this varnish of eucalyptus oil into the tubuli. The Swiss broach wound with its wisp of cotton is now dipped in a solution of base-plate gutta-percha and chloroform, and this in turn is carried to the ends of the respective root-canals.

From a bath of 10 per cent. formaldehyde, a cone of gutta-percha of suitable diameter is now taken and placed in one of the canals. A root-canal plugger is then dipped in pure alcohol and passed through the flame of the alcohol lamp, which in igniting the alcohol not only warms the plugger but thoroughly disinfects it before it enters the root and presses the gutta-percha cone down to the end of the canal. Sufficient gutta-percha having been placed in the respective canals and the plugger wound with cotton wet in chloroform, it is now used to pack the gutta-percha to the bottom of the canals in one solid homogeneous mass. The object is attained when the patient feels slight pressure at the end of the root, which denotes that the liquid gutta-percha is penetrating the foramen.

A minute amount of gutta-percha, causing the most imperceptible irritation to the soft tissues, cannot be considered in the light of an irritant if the operation has been attended with due consideration to aseptic surroundings. Its well-known compatibility with the soft tissues renders it the most suitable material for this purpose.

The end of the root is now hermetically sealed, and in order to provide against

any possible infection from without, the gutta-percha is covered with a cement of zinc oxychlorid; over this any other operation may be proceeded with.

The above simple technique is presented to your consideration as being based upon true chemical principles, and has the advantage of a record of many years of unparalleled success.

The object of not filling the root at the first sitting is to determine positively whether all particles of organic tissue have been removed. Where the pulp is alive it is impossible to be sure of this at the primary operation, because the contractile property of the cocain preparation is so great that it frequently only temporarily effaces some minute portion of living matter. On the other hand, in putrescent pulps it is frequently impossible to determine at the first sitting how far infection has proceeded.

We now come to another phase of our subject, and that is where the germs of infection have passed through the foramina into the periapical region. These are the cases which commonly give trouble to the most careful operator. This infected zone unfortunately exists owing to the fact that there has been no disturbance of the parts until the canals are cleaned. It matters little with what care the cleansing of the pulp-chamber and the canals may be attended to, should infection exist in the periapical region which has not been diagnosed by the operator the scaling up of the tooth will soon be followed by the characteristic soreness and tenderness which precedes an alveolar abscess.

It is on this account that the patient should be cautioned to return at the first suspicion of tenderness in the region operated upon. Having determined that this zone of tissue on the outer periphery

of the end of the root has become infected, even though no abscess has ever taken place, our attention is now directed to the destruction of the micro-organisms that exist in this locality, as well as the cauterization of the diseased territory.

ELECTROLYTIC DESTRUCTION OF MICRO-ORGANISMS. •

In 1897 I first published in *Items of Interest* a method for accomplishing this purpose which I have found invaluable. Cataphoresis for anesthetizing dentin was then one of the constant themes of dental discussion. Employing a cataphoric rheostat, I made use of it for the purpose of electrolytically destroying these germs. The method of procedure is as follows: The cathode sponge being placed under the rubber-dam holder against the cheek, an anode of chemically pure zinc is passed to the end of the root-canal, which has been kept wet with the hydrogen dioxid solution. The current of electricity is now turned on, and the voltage gradually raised until from one to five milliamperes of current is passing through the end of the root as denoted by the milliammeter. This current is left turned on from three to seven minutes according to the exigencies of each case.

The action of the electricity upon the chemically pure zinc not only forces the galvanic current through the end of the root into the infected area, but there is carried with it the zinc oxychlorid which is formed by the decomposition of the zinc. This active germicide itself not only electrolytically destroys all micro-organisms, but cauterizes the pathogenic area. So positive is this treatment in my hands that it is immediately followed by the scaling of the end of the root in the manner above described, and while there

may be some slight subsequent irritation due to nature's absorption of the coagulated tissues, this is soon followed by the complete cure of the diseased area.

This method of technique was brought out a couple of years ago in Europe by Prof. W. D. Miller of Berlin, and during the last International Dental Congress at St Louis a paper on the same subject was presented by his assistant, Dr. Kurt Hoffendahl of Berlin. The difference between the method suggested by them and the one presented by me in 1897 consists in their using the platinum point instead

of the chemically pure zinc point which I advocate. While there is no question of the destruction of the germs by the simple treatment of the galvanic current, still the coagulation of the infected and frequently necrosed tissue by means of the zinc oxychlorid is of the greatest advantage.

This method of sterilization is also recommended to those operators who find it impossible to penetrate to the ends of very fine canals, as the surest means of leaving the contents of those canals in an absolutely sterile condition.

DISCUSSION.

Dr. R. OTTOLENGUI, New York. I think, it will be my principal pleasure in discussing this paper to simply give the weight of my evidence in favor of what Dr. Rhein claims for it. He has very kindly kept me familiar with his technique in this class of work for almost the number of years he has mentioned; in fact, I may say that a tooth in my own mouth, which had for years been in the condition last described, after years of treatment was at last made comfortable by the treatment which he has described. I will go over just one or two points in the paper in the order in which they were touched upon by the essayist.

Beginning with cocain anesthesia for the extirpation of pulps, the essayist has warned us against the danger of forcing cocain beyond the apex of the root. There I naturally agree with him. I can also see how the danger is lessened if the application be shortened, but I cannot quite see how the essayist has been able to get

success in the limited time in which he claims to have done it, that is in from twenty to twenty-five seconds. I have operated practically as described in the paper, and I must confess that I have found pulps which I have eventually removed painlessly, but which I have examined after one minute of pressure anesthesia to find them absolutely painful, and in some cases it has taken actual time by the watch of from sixteen to eighteen minutes to anesthetize some pulps. This has not been simply a matter of taking eighteen minutes and then making an effort to remove the pulp, but attempts have been made every few minutes, until at last the pulp has succumbed and has been removed. I made the statement that they have afterward been successfully removed, because there are cases in which one cannot succeed. In the case of pulps which are the seat of nodules the cocain seems to act very slowly, if at all.

Now, gentlemen, when we come to speaking of preventing the passage of cocain through the end of the root, I say I admit the advantage of a short application as having a tendency to lessen the danger; at the same time we are just what the essayist has said—we are empirical. We do not know, or at least I do not know, whether the cocain passes into the pulp, as one might say osmotically, or whether it enters the blood tracts and follows the capillaries. It is my belief that it follows the capillaries; then, again, I have seen, in experiments, cases where I was tempted to believe it passed down along the odontoblastic layer between the pulp and the root-canal.

I wish to say here that I have submitted certain specimens to a biologist, and he tells me that things I thought I saw I did not see. I mention this merely because I touched upon this subject before this society last year, and I wish to show that the matter has not yet been solved. Until we know exactly how cocain passes into the pulp, it will be difficult to determine how to prevent it from passing through the end. I think you can readily see that if it be taken into the capillary system, it is most reasonable to believe that it passes immediately beyond the end of the root, because certainly the capillaries are continuous with the system beyond and through the end of the foramen.

When I spoke on this subject last year at New Haven, I touched on one unpleasant feature in my experience of this work which the essayist has not touched at all, which seems to indicate that he has had a different experience. It has been my unfortunate experience, in the removal of living pulps by pressure anesthesia, that some operations

have been followed by copious hemorrhage. We have been told nothing by the essayist about the management of this hemorrhage, and I would be glad if he would give us a little of the technique in that direction. Without waiting to hear it, however, I wish to say since the difficulties with hemorrhage at my hands I have abandoned the use of adrenalin chlorid, and have had no further trouble. And yet that is the recommended means of producing exactly what it seems to me it does not produce. It occurs to me that by using solutions treated with borine this can be avoided. I use it for the following reason: In a very instructive paper given before one of the Philadelphia societies, the author in speaking on this subject spoke of the advantage of adding to the mixture some of the essential oils, and making a solution with alcohol, and he said a simple means of preparing such a mixture is to mix the cocain with some of the antiseptics on the market known to contain these oils; and borine being the antiseptic I use, I make the mixture with that, and have had happy results with it. But sterilized water is also safe, and to my mind a better means than making solutions with adrenalin chlorid. I think that when you use adrenalin there is more danger of prolonged hemorrhage from the apical region than by using any of the solutions mentioned.

I cannot too strongly indorse the proposition of the essayist to open the tooth widely. If you were digging for gold, you would make a large enough hole to see the gold, but I have seen roots treated through little apertures through which, while it may be possible to pass an instrument into the canal opening, it was impossible to see the canal opening. I think we should be

able to see the opening in order to be thorough in our instrumentation.

I also cannot too highly recommend the simple means of sterilizing the canals—as Dr. Rhein brought forward so beautifully—with the use of kalium-natrium, otherwise called Schreier's paste. I will touch upon that in a little different direction from the essayist, because I would like a great many more people to have the success that we have had. Again and again people have told me that they could not use this material because they could not control it. This medicament comes in a sort of test tube, and must be protected from air to prevent disintegration or oxidation, and is therefore covered with paraffin. As Dr. Rhein said, make a little puncture through the paraffin and remove as much as will come out on an instrument. Now, to preserve that medicament we must, as soon as we have finished, seal the opening—and that is only a moment's work, but is often forgotten, and when it is forgotten you will find that through that opening there will be a little oozing of the material. Now clean off the paraffin and seal it again. It is that point overlooked that has made so many people discard this remedy.

I agree with the essayist in what he said about the medicament finding its way into inaccessible canals, but in spite of that there has been a method which has been exceedingly useful as an adjunct to this property. I take a Donaldson broach with the broach barbs cut off, hold it in my fingers against a stone on the lathe, and grind off the sides until I make a very fine three-sided reamer. The stoned surface of the broach makes it rough enough to take up quite a sufficient quantity of the kalium-natrium through the little opening, and that

very fine point will go into the canal, so that you have not only the action of your medicament, but also a mechanical reaming action. It has many, many times occurred in my practice, that what has seemed the tiniest aperture could be reamed out with a few turns of this reamer, and this, aided by the action of the remedy, makes a readily accessible opening into the canal.

I am willing to admit that there are canals the ends of which we cannot reach. That is a most unfortunate circumstance, because, this being so, we are apt to think that we are in the presence of an instance of that kind when we are not. I think that that one fact is of tremendous importance, and most unfortunately so. There are some, however, which seem to be closed, but into which one can operate with this reamer.

I want to say in closing that there is a great deal in what the essayist has said about electrically treating these root-canals, and I can hardly believe that the platinum point will be in any sense of the word as useful as either the zinc or possibly the silver point. The chlorides of these metals are produced, which are antiseptic, germicidal, and exceedingly useful in these conditions. He will tell you that he is so sure of himself when he treats these conditions that he does not hesitate to fill the root-canals afterward, and he did that with me, but I had three days of unhappiness afterward.

DR. A. N. GAYLORD, Philadelphia. I have nothing but the highest recommendation to give you of the kalium-natrium paste, which I have used since my later college days. I think it is one of the grandest things I have ever seen, and it is a surprise to me that it is not more generally used. It is certainly a

simple thing to use it, and it has many advantages. It is perhaps a lamentable fact, but nevertheless true, that a great many men in our profession are trying to treat root-canals without first applying the rubber dam. Any man who undertakes to use the Schreier paste will of necessity have to put on the rubber dam—and if it is worth nothing more than that, it is a great thing on that account. I am reminded of a statement made by Dr. Kirk in one of his lectures. In speaking of the importance of using the rubber dam, he expressed himself in these words: "If a tooth is worth a dam, put it on." I think that is literally true, and if men would carry out that idea their success in root-canal treatment would be much greater than it is.

Dr. Rhein in his paper tonight made use of the term "absolute sterility." I would not for one moment discourage myself or anyone else in the effort to obtain absolute sterility, but I feel that that is beyond what we may hope to reach. Everything in that direction is of course beneficial, but when we consider the methods by which the surgeon performs an operation under conditions of sterility, we must take into consideration that his hands are cleansed to a far greater degree than we as dentists can sterilize our hands. After his hands are sterilized he touches nothing but sterilized towels, and sterilized instruments, and the tissues are sterilized by assistants, therefore the tissues that he touches are sterilized. If we were to attempt to undertake operations under similar conditions our instruments would have to be kept in antiseptic solutions, the rubber dam sterilized after being placed on the teeth, and then the teeth sterilized before working upon them. I feel that if we consider these steps in producing steril-

ization we shall be discouraged as to obtaining absolute sterility.

As to carrying the cocain solution just to the apical foramen and no farther, while I agree with Dr. Rhein that it would be a good thing to stop at that point, we must admit that we are working entirely in the dark. We have not the slightest indication of any kind as to when we reach that point, nor can we, as far as I can see, to any degree of perfection determine the conditions of the root in which we are working. To take an extracted tooth and examine the roots, many of them in a tortuous condition, makes a man wonder what he can do when he works through an opening into that root when embedded in the tissues. Perhaps you are all familiar with the statement of Dr. Cryer that he prefers to diagnose the presence of an impacted tooth by the explorer. We are perfectly familiar with the possibility of determining the presence of bodies by the touch of the instrument. We are all familiar with that in the removal of tartar from the roots of teeth; but in working in root-canals we are working with broaches which are flexible, and I am free to confess that I cannot tell with any degree of certainty what I am dealing with in that canal, because I cannot see it, and the broach does not give me a clear knowledge of the conditions, because of its flexibility.

I have witnessed in Dr. Rhein's office with a great deal of pleasure the use of the electric current with the zinc electrode. I have seen his results and am very much pleased with them. I have discussed the matter with Dr. Rhein, but I am as yet in the dark. He says the material carried into the tissues is zinc chlorid. I do not pose as a chemist, but, from the knowledge I have, I can-

not understand where or how the zinc chlorid is produced. If the zinc point be carried beyond the apical foramen and touches the soft tissues, as Dr. Rhein argues, it may come from the sodium chlorid in the tissues, but in the canal, while there may be, and is, a very slight amount of sodium chlorid in the dentin, yet that dentin does not sufficiently decompose to form any chlorin to unite with the zinc to form zinc chlorid, and so far as I know there is no solution placed in the canal prior to using the zinc electrode, and I cannot see how the zinc chlorid is produced. To my mind it would be more natural for the metallic zinc to be deposited, and what would become of the deposit from the action of the tissues afterward I cannot state.

However, I cannot but heartily indorse the paper, and I feel sure that anyone who will take up the use of the Schreier paste will be more than gratified with it. I know of nothing that will destroy the foul odor of a putrescent pulp as that preparation will. I have in my early experience placed in teeth antiseptic dressings, and on taking them out found a foul odor, and had to continue to dress until that odor had disappeared. By the use of the sodium and potassium compound, within a very few minutes this foul odor will be eliminated, and the cotton with which the canal is wiped out will have an odor of the alkali.

Dr. L. ASHLEY FAUGHT, Philadelphia. I have nothing but words of commendation for this paper. I can only add a few words on some portions of the technique which I have found to be true in my own dealing with roots, the removal of pulps, and their subsequent treatment. The one important point he makes of the necessity—the absolute necessity—of gaining a free opening to the orifice of

the canals; here, I feel and have felt for some time, is where a great many fail in their treatment. We must get that. If a house is to be of any value to us in the future the cellar must be perfect, and in like manner all the beautiful tissue we may save is of no use to us unless the foundations be in good condition. No matter what method we use, that is absolutely essential. I feel that this is delicate work, and I agree with the essayist when he suggests that we should approach the operation with truly surgical feelings, and that we must maintain as far as possible sterile conditions. I fear that failure follows, many times, where success would be possible in treating roots, because of the careless methods employed in the work. I feel that I can only add all the force I can command to the advice that one should go about this work carefully.

Then, as to instrumentation, as to broaches, etc., as the essayist suggests, be careful to inspect them before use. I find that is a very important feature, and you will be surprised at how quickly you will discard a broach if you are careful to do that. It is my practice not to use a broach the second time. I have come to such a condition of fear that each case is approached with a new broach.

I want to add a word of warning in the use of other than steel broaches. We do use others, but I always have more fear in their use than with the steel ones. They seem not capable of receiving the same cutting with accuracy. I grow very wary when using any other than steel broaches, and I use a great deal more care with them than I do with steel broaches. They do not seem to stand the wear and tear.

With regard to the point Dr. Ottolen-

gui referred to in his remarks about making solutions with adrenalin. I may say that I have discarded the use of adrenalin in that relation, because it is a stimulant of the vaso-motor centers, and in a combination with cocain hydrochlorid the cocain will contract the tissues, and then will admit of a rapid dilatation of the vascular tissues and we have the more free hemorrhage following. What peculiar effect this drug in combination with the cocain has on the vaso-motor system I am unable to explain, but that we do have some distressing conditions in its use is true, as Dr. Ottolengui stated.

Dr. P. B. McCULLOUGH, Philadelphia. I would like to pay my respects to this paper. Many remember that Dr. Garretson was wont to say that there were two kinds of sense—one that the average person called common sense, and the so-called educated sense—and it is in the category of educated sense that this paper belongs. What Dr. Rhein has presented emphasizes the truth of the aphorism that doing old things well is almost equal to creating new things. The method is not original with Dr. Rhein, but there is no question that it is scientific. Much of the work and of the technique that Dr. Rhein describes has been my practice for many years, and the difference is only in such minor points as are of little moment. For instance, I do not use mercury bichlorid, and I use methods for measuring the diameter of the foramen of the roots so as to fix the size of the gutta-percha cone to fit those with large and those with small openings. I have not used cocain anesthesia to any extent, and I have not used the bottle of adrenalin that I bought when the preparation was first put on the market. One or two applica-

tions of this preparation gave me no results that I could not obtain with other preparations already in use. I have not used the pressure cocain anesthesia for the reason that I have obtained the same results with the use of carbolic acid. I recently removed the crown of a vital lateral incisor, reduced the root with a stone, beveled the root, removed the pulp, and discharged the patient in twelve minutes; and that was done with carbolic acid.

Undoubtedly, as Dr. Rhein says, gutta-percha is the most acceptable material to the soft tissues. That has been shown by test, and presented in many articles, particularly in a paper published some time ago which dwelt upon the relative acceptability of foreign materials to the human economy. It showed that a lead bullet was more acceptable to the tissues than a steel one, and it also showed that materials having a smooth surface, such as gutta-percha, were very much less productive of irritation than other materials.

Dr. F. L. FOSSUM, New York. There are a great many things to be considered in the treatment of root-canals. There is no doubt that the sodium and potassium mixture is a most powerful solvent and does much that has been claimed for it in cleansing root-canals; but great periodical disturbances often follow its use, and nothing is more distressing to the conscientious dentist who has taken all precaution against infection than to have the patient come back in great pain from such treatment. I am not alone in saying this, as many others have had the same experience.

In the case of putrescent root-canals I have had good results with a paste of aristol and formalin, as this will render the decomposing gases inert, and it is

very seldom that even a very tender tooth will not become comfortable after being treated with this composition.

Dr. O. T. RULE, Meriden. I wish to ask Dr. Rhein how he applies the sodium dioxid—in powder or in solution? Also why he uses mercury bichlorid instead of formalin.

Dr. RHEIN (closing the discussion). I should feel gratified by the kind manner in which the paper has been received, but I wish that those who do not agree with me had had opportunity to oppose what I had to say in a more thorough way, because I agree with what Dr. Faught said about discussion of papers this afternoon.

I intended to present the subject in as short a manner as possible, hoping to give some idea of the method in about fifteen minutes, but even then I took up thirty minutes. I realize thoroughly that I have not given an extended treatise on the technique of the work embraced in this title. I simply meant to cover the A B C of the work, and did not go into alveolar abscesses and deep infections because I did not want to lengthen the paper.

In regard to the point Dr. Ottolengui brought out about the time required, I can only say this: I have been interested in the use of cocain in every form presented, from the day it first landed in this country. With Dr. Morton of New York I made a number of experiments in regard to the use of cocain in various ways, and especially by means of cataphoresis. I came to the conclusion that there was only one form of this drug which was readily forced into the tissues or organs, namely, the hydrochlorid, and that it must be in aqueous solution. Just as soon as we depart from the strictly aqueous solution

of cocain we produce a substance which impedes its own progress in some form or other. Alcohol and the essential oils act upon the surfaces so as not only to impede the effect, but so as to frequently impair and nullify the possibility of the osmotic effect of the cocain.

Dr. FOSSUME. How about glycerin?

Dr. RHEIN. I said any preparation outside of the strictly aqueous solution, and glycerin, while it has much water in it and takes up water readily, unquestionably meets with the same objection, as was demonstrated by experiment at that time. I simply give this as the result of our experiments, and in substantiation of it I will say that at that time I tried alcoholic solutions, and failed utterly to get the same results as with the aqueous solutions.

In regard to the time of producing anesthesia, all I can say is that if I do not succeed in producing instantaneous anesthesia, my conclusion is that there is something wrong with the technique, and therefore I limit myself to twenty or twenty-five seconds. Of course there are what might be termed failures in the total anesthesia of the pulp. This is rather to be desired. In my desire not to force the anesthetic solution beyond the apex I have sometimes failed to go to the end, and every time the patient flinches I am rather glad, because I know that I have not forced anything through the foramen. After I remove the pulp I begin to look for sensation in the apical region. There is, however, another source of failure, and that is in multi-rooted teeth, where sometimes the cocain will be forced into some of the roots and not into others; of course there are times when additional pressure on these individual root has to be used. Outside of that, it does not make any difference

how much of a nodular mass is present in the canal. I have had failures temporarily, as Dr. Ottolengui has said, but they have been failures of the technique at the time of working. There has been no failure where I have succeeded in getting the cavity in such a condition that direct pressure could be brought to bear upon the pulp, with no possibility of the cocain going in some other direction. The solution will naturally go in the direction of least resistance, and if there is any possibility of escape from the canal, the solution will be sure to find it.

In answer to the question whether the cocain is taken into the circulation, I can only say that I have never seen a single patient show the constitutional effect of cocainization from pressure treatment in my hands, and therefore I cannot believe that the cocain enters the circulation. I don't say it is not possible, but I have never seen a case, although I have had many cases of post-operative accidents from cocain used by injecting into the soft tissues.

In regard to the use of adrenalin, Dr. Ottolengui brought up the question of hemorrhage. I did not go into that in my paper for the reason already mentioned—I did not want to lengthen the paper. Hemorrhages do occur occasionally, but adrenalin is never indicated in these cases; its use to me would be similar to the pouring of kerosene on a fire while trying to put it out. Adrenalin, while it contracts the vessels the same as cocain, gives an after-effect which is very deleterious, leaving the vessels wide open—effects which are not desirable.

With the Schreier paste I have had several cases where there was a tendency to hemorrhage on the return of the patient, but they have been easily con-

trolled by the use of some of the hemostatic agents. There are cases of hemorrhage where there is a large vessel in the pulp; there are the bleeders—the hemophiliacs. This class of patients are liable to severe hemorrhage in the use of any agent that primarily contracts the bloodvessels.

Dr. Ottolengui, in his closing remarks, spoke of the three days of discomfort after the use of the electric treatment of the periapical region, and in speaking of that subject I will try to answer the question of Dr. McCullough as to the extent of the diseased area in these conditions. I know how much the diseased area is when I treat it, because I take a radiograph of such a tooth, and that outlines to me definitely the extent of the diseased area. There is nothing that the radiograph outlines better than the extent of this diseased area. I do not attempt to cure by this means a root in which the outer periphery is necrosed, although I heard Dr. Hoffendahl make the statement that he had done that sort of thing. Such a case is better treated by surgical means than by electric treatment. In cases where there is a small area of infection, what is known as "blind abscess" or something of that kind, the forcing of the galvanic current through the canal is bound to destroy every micro-organism that may be present there. It destroys those existing and inhibits the development of others, and the zinc chlorid cauterizes the tissue.

Dr. Gaylord wanted to know how the zinc chlorid is formed. I am not a chemist myself, but I take my data from chemists. They assure me that there is sufficient chlorin generated in this manner to form zinc chlorid. That is the

chemistry as outlined by men like Kirk, Morton, and Buckley. I made the experiment of taking the zinc point and passing it through a piece of raw beef, lying over the albumin of a fresh egg, and the albumin was coagulated as beautifully as if poached over the fire. I know very few agents outside of zinc chlorid that will do this as perfectly as it was done in this experiment.

Dr. Gaylord asked about the possibility of reaching the very apex of the foramen. I do not reach the apex of every root. I do not want to reach it in every root, because there are certain cases where the end of the root is sealed with inorganic matter in such a way that the apex cannot be reached except by drilling. There is no necessity in such cases for reaching the end of the canal. What I claim for the sodium-potassium is that it will reach every particle of organic matter, and in those cases where the apex cannot be reached it is immaterial whether or not a small portion of inorganic matter is left in the root.

In speaking of Dr. Ottolengui's case, where he had three days of discomfort, I want to say that his case was one in which the root was wide open, and a good portion of the periapical region was involved, and we had to cauterize it to a great extent. I believe I made an application of 7 or 8 milliamperes, more or less, for eight or nine minutes. My recollection is that I applied the current for a considerable length of time, because there was an extensive area that I wanted to destroy, and of course there is bound to be considerable discomfort in a case of that kind. The cauterization of this tissue is followed by resorption, which action is more or less painful. I have had cases of this kind where I have had

to prescribe morphin in order to relieve the patient from pain.

One gentleman asked my method of using the sodium dioxid. I have never used the sodium dioxid, because at the time it was introduced I said there were two methods, this and Dr. Schreier's, and I took the Schreier method because it was casier, and the more preferable of the two. Some might prefer the other, and there is no reason why the same results could not be obtained in that way. Another gentleman asked why I used mercury bichlorid in preference to formalin. I use it because it is a better germicide than formalin. It stands out as the only real germicide we have at our command, and a certain portion of it is deposited in the tubuli of the teeth.

Dr. Gaylord spoke of absolute sterilization. I realize that such a condition is practically impossible, and what I meant was that we should use every precaution at our command to bring us close to this condition; when I used the words absolute sterility I referred to the condition of the canal, and there we must have absolute sterility; if we fail at that point our operation is a failure. Because we cannot have absolute sterility in all the surroundings is no reason why the canal cannot be absolutely sterile, and I defy anyone to find any infectious material in a canal treated in this manner.

On motion the subject of Dr. Rhein's paper was passed.

Dr. JAMES McMANUS, Hartford. While the gentlemen are with us, I want the society to express their appreciation of the papers presented, and the interesting and amusing manner in which the discussions have been conducted this afternoon and evening. I move that a rising vote of thanks be given to the gen-

tlemen for their presence, and for the very interesting and instructive papers presented.

The motion was carried and the so-

ciety extended a vote of thanks to its guests.

Motion was then made and carried to adjourn until the morning session.

WEDNESDAY—Morning Session.

The meeting was called to order Wednesday morning, April 19, at 10 o'clock, by the president, Dr. D. W. Johnston.

The first order of business for the session was a paper by Dr. F. L. Fossum, New York, on "A New Method of Removable Bridge Work," as follows:

A NEW METHOD OF REMOVABLE BRIDGE WORK.

By F. L. FOSSUME, D.D.S., New York, N. Y.

IN this short paper, which I may have condensed too much, I wish to present to you a method of removable bridge work which has been carefully considered, tried, and found good.

FUNDAMENTAL REQUIREMENTS OF BRIDGE CONSTRUCTION.

The fundamental requirements of bridge work in a general way are utility, esthetic appearance, and cleanliness. The requirement of utility is fulfilled by stationary bridge work. Esthetic appearance often requires the restoration of contour by artificial gum tissue, and in order to meet the third requirement—that of cleanliness—we are obliged to resort in such cases to removable bridge work. Now, all bridge work to fulfil the first requirement—that of utility—must be built on abutments which are able to support the strain. The recognition of this fact and the difficulties in many instances of its attainment in removable bridge work often cause us to abandon the idea of removable bridge work in cases where it otherwise would be highly desirable. The desirability of a system of removable bridge work making feasible in the largest number of cases the

fulfilment of all requirements has occupied my own mind, and I believe that I have solved the problem.

If the abutments or pillars supporting the bridge can be made at all times to support one another they will stand many times the stress which otherwise would loosen them or move them out of relation. The recognition of this fact which prevails in stationary bridge work has led me to consider the possibility of intersupport and the maintenance of rigidity of abutments by a stationary bar uniting the abutments. Two cases which I will describe where I was compelled to abandon the idea of bridge work or else to construct it on unusual principles will illustrate my solution. As you will see from the models (see Figs. 1 and 2), on which are duplicates of the bridge work which the patient is wearing at present, the four upper incisors and all the lower molars with the exception of one are missing, and so the entire pressure of occlusion was brought upon the upper bicuspid and canines, and in consequence these teeth had become loose. The gum and the alveolus had absorbed considerably and the upper lip had sunk backward. A stationary bridge was out

of the question on account of the large gum-piece that had to be supplied, and Griswold springs or split pins were inadequate under the circumstances, having to be anchored to loose teeth.

A NOVEL BRIDGE.

After carefully studying the case, I decided to try something on the principle of the splints for loose teeth which I have used for many years with great success. The canines and bicuspid were

with posts in the roots as before, actually making cast gold fillings with posts running into the root-canals. All these pieces were then inserted into their respective teeth and a plaster impression taken. The pieces were then removed from the teeth, put into the plaster impression, and a cast obtained.

On this cast the canine and bicuspid attachments for either side were soldered together, then reinserted into the teeth, and another plaster impression was taken.

FIG. 1.

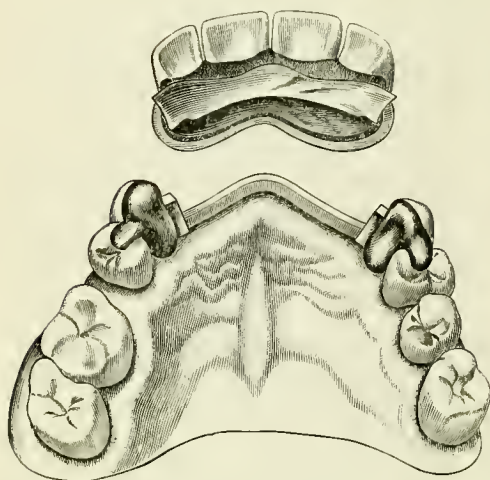
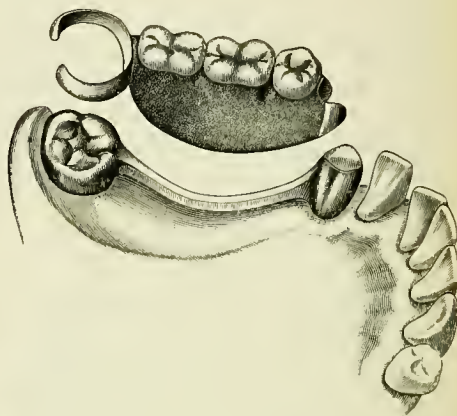


FIG. 2.



devitalized and the apical foramina sealed, and posts of platino-iridium wire constructed for the root-canals. Gold plate 24-karat, No. 36 gage, was burnished over the palatal surfaces of the canines, and through this gold the platinum posts, which already fitted the canals, were forced. A little hard wax tacked the posts and gold together, which were now withdrawn, invested, and soldered together; the pure gold covering being heavily reinforced. As the bicuspids had large mesio-occlusal cavities the pulps were removed through these and the gold was burnished into the cavities

Upon this new cast I fitted the platino-iridium bar connecting the right and left attachments, and soldered it to these. The whole piece was again inserted into the mouth and another impression was taken, upon which model was swaged a platinum piece fitting perfectly over the bar and alveolar ridge. A carved block of four teeth was then attached to the platinum covering by vulcanized rubber. Gold clasps had previously been soldered to the platinum covering to assist in holding the removable bridge-piece firmly in position. (Fig. 1.)

While I have minutely described the

process of restoring the teeth in this difficult case, it is evident that the key to the whole construction, and its real novelty, is the bar which remains in the mouth when the bridge is removed, connecting the attachments of the piers, holding these firmly in place and preventing any spreading apart or contraction, and giving a solid foundation to the removable piece. This applies to any bridge to be constructed. Take, for instance, where a lower bridge is to be made between the third molar and canine, a gold cap may serve as the attachment on the back tooth, and any other appropriate form of attachment can be used on the front tooth

FIG. 3.



Vertical cross-section of bridge.

and the bar soldered between them, and a removable piece constructed thereon. (Figs. 2 and 3.)

There are, of course, many other variations where it may be applied, from a one-tooth bridge to one including the entire fourteen teeth, but all are necessarily based on the solid bar which connects the attachments on the abutments. As to securing the removable pieces in place, any of our modern attachments, can be used just as the individual case may require, and there need be no danger of it falling out, choking the patient, etc. The bar supports the bridge from end to end, so there is no rocking or other movement if it fits properly, even without clamps or springs, except that

without some such retaining device it might slide out of its place.

AN ILLUSTRATIVE CASE.

I hand you another model; it is my first case of this kind and is instructive and interesting on account of its being an instant success and from the novel manner in which the removable piece is clasped in place. The bridge carries eight teeth, six incisors and the two right bicusps. The abutments are the roots of the left lateral and the right canine. For these, Richmond caps with posts were made, and the bar soldered on top close to the palatal edge of the caps. The bar was not allowed to extend close to the teeth approximating either side, because a short cross-piece, as shown on the model, is soldered to each end of the main bar at this point. This part of the work being finished, it was placed on the roots in the mouth and a plaster impression was taken into which the bar with caps was placed. Upon the model obtained a platinum piece was now swaged as in the first case, and to this platinum base at each end, right over the short cross-pieces, two pieces of clasp metal were soldered and bent so as to slip over and hug against the cross-pieces. By bending these slightly more when the piece was finished, they snapped over the cross-pieces, locking the removable piece securely in place, and it has not been necessary to make any adjustments since the time of its completion on January 7th last.

The teeth on the removable pieces which are shown here are attached with rubber, but of course porcelain or all-metal bridges can also be used. The carved block and swaging was made by the Stowe & Eddy laboratory.

DISCUSSION.

Dr. JAMES McMANUS, Hartford. I do not like to see the time wasted, and for that reason will say a few words on the paper of Dr. Fossume. The exhibition of this work shows us the advantages of cleanliness. I want to make this one remark: Our profession is essentially a mechanical one; it implies the education of the hands, and while we are educating our hands we have been trying to educate the public to where we will be classed with the other professions. If anyone present has ever before questioned our right to be classed with the other professions, they cannot, since this beautiful exhibition, question for a moment that dentistry as practiced today shows our wonderful ability as mechanics, bridge-builders, architects, and artists. The style of work we have just looked at shows the highest order of art and mechanics. It is the real artist's work in its relations and practical use in the mouth. For one, I have been more than pleased to have the opportunity to witness the work of Dr. Fossume, and I think he deserves, and we should give him, our hearty thanks for coming here and giving us the opportunity to see and inspect this work.

Dr. A. N. GAYLORD, Philadelphia. I can see great advantages to be gained in certain cases by this work, but in others I see great disadvantages. I think we have all seen cases where our fixed bridges produced irritation to the gums. The gums become congested from the pressure against the bridge, and in some cases the bridge will become very nearly covered with gum tissue; I have seen two or three cases of this kind which

were most difficult to handle. This of course is a removable bridge, but the bar which runs across from abutment to abutment, coming in close apposition with the gum, I think will be difficult to keep clean, and in case of irritation it would naturally press against the gum and cause further congestion. This may possibly not be the case with this kind of bridge work, but I know it does exist with fixed bridges, and I see no reason why the trouble should not occur here in the same way. Another point: I am inclined to think that, owing to the fact that the teeth rest on a piece which is more or less yielding, the point of attachment between this bar and the gold cap in the lower case will have to be considerably strengthened, or the gold cap will be torn or broken away from the bar connecting it.

Dr. HENRY McMANUS, Hartford. If you propose to make objection to this kind of work on the wilful admission of lack of skill, of course the bridge will not succeed. Dr. Fossume showed me the models yesterday, and I hail with delight this method, for it strikes me as the most practical and scientific thing introduced into dentistry in a great many years. We are building bridges, and we have had many failures, not from the lack of skill of the operators but because the bridges have been built on wrong principles. When a man builds a bridge the thing that demands the most attention are the foundations—the abutments. When he gets his abutments properly fixed, he builds the framework, ties it all together, and he has his bridge. When a dentist builds a bridge,

he takes some abutments hardly strong enough to support the crowns, makes a bridge, sticks it on, and in many cases trouble ensues almost immediately. When it does not cause trouble it is more or less a matter of luck. Dr. Fossume has secured his abutments, and built his bridge in such a way that they will have lateral support, and it seems to me a good idea. I had the misfortune once to build a bridge for an architect. He had been interested in all kinds of bridges, and had made some study of dental bridges. He told me that in building a railroad bridge he figured out mathematically the strength of the abutments, and that the factor in the railroad bridge was a plus. He said it seemed to him that the factor in a dental bridge was a minus. It appears to me that Dr. Fossume's method of strengthening the abutments, and the lateral bar fitted to the gum, has taken away the minus.

Dr. FOSSUME (closing the discussion). Dr. James McManus spoke of the fact that although we are surgeons we are pre-eminently mechanics. There is no operation that can be performed in the mouth that is not a mechanical one, from the scaling of the teeth to the construc-

tion of an inlay. No matter how scientific one may be, if he be not a natural mechanic he will certainly cause himself much trouble, give his patients much pain, and have many failures which he would not have had had he possessed the requisite mechanical ability.

The point Dr. Gaylord brought out about cleanliness is a very proper one, and I am glad he mentioned it. The first piece of this work I put in was in January, and I have had occasion to see it constantly since that time, and there is no inflammation of the gum tissues around the bridge. It looks as healthy and clean around the bar as when it was first placed in the mouth. There should be a space there allowing a strip of sand-paper to be passed in between the gum and the bar, so that it can be polished underneath. Then when it is cemented in the mouth the edges of the bar where it meets the gum line will be rounded.

The subject of Dr. Fossume's paper was passed.

The President announced as the next order of business the reading of a paper by Dr. JOSEPH HEAD of Philadelphia, on "The Adhesive Filling."

The paper was as follows:

THE ADHESIVE FILLING.

By JOSEPH HEAD, M.D., D.D.S., Philadelphia, Pa.

SEVERAL well-known authorities on operative dentistry have asserted that if a gold filling be carefully inserted in a properly prepared cavity it will never prove a failure. How they can say this in the light of the obvious fact that a perfect tooth will decay or may be broken by a chance bite is incomprehensible. Even if they mean that nine out of ten conscientiously inserted gold fillings are carried to the grave or remain in position until the tooth falls out from senile recession of the gum, facts will hardly bare out their contention. Any future speculator who digs up a graveyard hoping to realize on the large amount of gold yearly used for filling teeth will be doomed to disappointment, as most of these fillings find their way, not to the grave, but to scrap gold of the dentist's drawer.

Why is a gold filling twenty-five years old pointed out with such pride if they are of common occurrence? What dentist in this assembly who has been practicing thirty years can honestly say that fifty per cent. of all the gold fillings he has inserted during his life are now in position with no decaying leaks? In my twenty years of practice I have seen the work of Webb, the father of extension for prevention, and also the gold fillings

of many other excellent operators. Every one of these men have their high percentage of successes, but they also have their failures, with gold fillings; for I have seen these failures, and in many instances replaced them with fillings that have had their percentage of failures, which will increase, no doubt, as time goes on.

When a new patient comes to me with a mouth full of gold fillings over five years old, a careful examination almost invariably proves fifty per cent. of them to have leaking edges with the discoloration of progressive decay. These fillings I invariably repair or replace, mostly replace.

Before Professor Miller made his discovery of what decay consisted of, it was considered good practice to allow a discolored gold filling to remain until it dropped out, or until at least there was palpable softening of the enamel margins. But in the light of modern science the man who will now let such a filling remain, with its ever-advancing general infection, is guilty of malpractice. And yet these fillings that I remove and replace are the work, in many instances, of prominent operators. If such men as these fail, where is the hope for the average dentist? And yet, when we examine

the conditions, is such a percentage of failures remarkable?

Gold is non-adhesive, but it spreads under the hammer and theoretically approaches absolutely to every portion of the cavity surface. But practically gold has such a tendency to bridge that it is almost impossible to avoid infinitesimal air-spaces between the tooth and filling. Dr. Black recognizes these air-spaces and measures them with the air-spaces in the gold itself by specific gravity. Although perhaps infinitesimal, these air-spaces may form a chain leading up to the margin of the cavity. The margin may at first be perfect, but the slightest fracture, infection, or acid corrosion may open into a direct route for infecting the entire underlying dentin. Cement is adhesive, and by having a soft cement lining into which the gold is squeezed all of the dangerous air-spaces are avoided, and when infection does attack the cavity margin, it cannot penetrate to the dentin and the damaged edge can be repaired with the certainty that no dangerous infection has been covered up.

Indeed, when we consider the circumstances and the crude method of insertion ordinarily employed, it is only surprising that there are so many successes. In addition to dangers of infection, we have molars that may sustain a force of 200 pounds, bicuspid and incisors from 125 pounds to 50 pounds. It is a well-recognized fact that perfectly sound teeth may be fractured by a chance bite on a hard substance. This being recognized as an axiom, how could we expect that there should not be a certain number of failures from fractures when a tooth-substance has been undermined by infection, and the natural arches of resistance cut away and replaced by a non-adhesive filling, dovetailed into position with the blows of a hammer.

Theoretically, as before stated, we are supposed to make perfect adaptation of the gold with the tooth-walls. Every man in performing the simplest operation has his factor of personal error, and when we take into consideration that this hammering of gold requires a nicety of manipulation that taxes the ability of the best mechanic to its limit, we cannot doubt that with the ordinary ability of the ordinary dentist this percentage of personal error is high. When we consider the risk of powdering the enamel incident to hammering, when we recognize that an imperfect edge will let in infection that will mean the undermining of the cavity walls, when we know how few patients keep the fillings free from infection that may attack even a perfect margin—all these factors make it impossible for the best dentist on earth to be sure that this gold filling may not fail. The engineer in making a structure makes it five times stronger than any strain in all human probability it will have to support. Having done this, if it be kept painted and guarded against corrosion, he has a right to assert that his work cannot fail. But we dentists in inserting a gold filling do exactly the opposite. Knowing that our fillings may have to stand a strain of from 200 pounds to 50 pounds, knowing that this strain if applied suddenly to a healthy tooth may fracture it, instead of putting in a filling that may stand a strain of from 1000 pounds to 250 pounds, we put in a filling that leaves the tooth weaker than it was normally. And then, in addition to this necessary neglect of structural laws, we leave these filled, weakened teeth immersed in a bacterial fluid that in a certain percentage of cases will attack the enamel margins and undermine the dental foundations.

Gold has too sound a record to require

defense. Some teeth it has permanently saved; in others it has retarded decay for years. In some teeth through faulty manipulation and infectious environment it has been disastrous. The best friends of gold do not deny its obvious disadvantages; they try to remedy them. Gold has the best edge strength of any filling material in the world, but the difficulty of its manipulation and its non-adhesiveness to tooth-structure make a certain percentage of defective edges.

These facts alone would account for the present-day usefulness and popularity of amalgam. Amalgam can be more readily adjusted to the cavity margins than can gold. It is true that amalgam warps and bulges under continued stress, but even with this disadvantage partly overcome by the antiseptic action of oxidization, taking all the fillings put in by the profession as an average, in my opinion the amalgam fillings preserve more teeth from actual decay than does gold. Amalgam is used with fair prospects of success in cavities where gold would be but a desperate remedy.

Let me refer to a case in my own practice that I believe is typical. A patient came to me with all the crown cavities of her molars filled. Half of them were filled with gold and half were filled with amalgam. All the amalgam fillings were doing good service without a sign of marginal decay. All of the gold fillings were defective, with rapidly breaking-down edges. On inquiry the patient explained that the amalgam had been put in about ten years previous by her dentist because the teeth were too sensitive to bear the hammering, but within the last three years he had replaced some of them with gold as a more permanent filling. I replaced the defective gold fillings with adhesive gold fillings which will

be described hereafter, but since the amalgam fillings had been giving good service for ten years, I allowed them to remain as they were.

I appeal to every dentist who has been practicing for fifteen years if he has not had similar experiences. I believe that the unprecedented rise in the popularity of inlays, even poor inlays, is largely due to the fact that the cement makes defective margins impossible. It is not my purpose to condemn the use of gold, but to show how a gold filling can be put in so that insidious decay, though it attack the edges, can go no farther. The methods of filling cavities with cement and gold are as old as cement itself. Sponge gold and modern science have probably rendered them more feasible. I shall not go into general cavity preparation, but shall deal with general principles.

To put in a gold filling adhesive with zinc oxyphosphate the procedure is as follows: Prepare the cavity with flat foundations and undercuts. Moss fiber gold or any good sponge gold, and No. 30 foil or any good foil, should be annealed and prepared ready for use. Soft creamy zinc oxyphosphate should then be placed in the cavity and squeezed out by mats of moss fiber gold until the entire walls of the cavity are lined with a film of zinc oxyphosphate covered by a layer of gold. The moss fiber gold should be condensed in such a way that it will not rock after the cement has begun to set. The bottom of the cavity should be filled with a sufficient mass of gold to permit firm, hard condensation and smoothing with a finishing bur. When this has been done more gold can be added by hand or mallet to the bottom of the cavity until the filling is within about one-sixteenth of an inch of completion. Then the enamel edges are

burred smooth with a finishing bur and the surface made level. The entire gold surface should now be gone over with a fine-pointed plugger to discover and condense any soft spots. These should be firmly and evenly filled, when the filling can be finished with No. 30 foil with the mallet in the ordinary way.

The method of filling with amalgam and cement has often been described. Prepare the cavity with undercuts, sterilize, and keep dry. Mix the amalgam to the consistence of thick mush. Place creamy zinc oxyphosphate in the cavity and squeeze it out as much as possible with the amalgam. Then clean the edges, dry out the remaining amalgam by compressing it in a napkin with pliers, and add the dry amalgam to the soft amalgam in the cavity until the filling is of a favorable consistence for setting. Carve to shape, send the patient away; smooth and polish on the following day.

It is not claimed that failure or recurrence of decay with this method is impossible. While we are human beings failure with every method is possible.

But it is claimed that this makes adhesive gold and amalgam fillings that ninety-nine times out of a hundred cannot be undermined by decay without giving full warning. With the gold filling, the dentin and most of the enamel is protected and supported by cement, and while the final hammering may possibly powder enamel rods on the edge, yet it is most improbable, since they are supported by the cement. But even if this slight microscopic powdering does occur and microscopic decay start, when it develops sufficiently to become apparent we can repair it with a firm assurance that this defective margin does not connect with any leak by which infection may have already started to undermine the foundations of the filling.

Of course the final pieces of gold can be burnished on the enamel edges after the Herbst method, but if gold be always kept between the hammer and the enamel, with enamel rods supported by cement on the side and dentin beneath there will be little danger that fracturing will occur.

DISCUSSION.

DR. L. C. TAYLOR, Hartford. I can fully sympathize with all that Dr. Head has said this morning, and can indorse the paper as a whole. I wish, however, to make one or two suggestions with regard to the method of starting these fillings. One little point in the starting of a filling in this way, as I am inclined to see it, he did not speak of, and that is the benefit of heat in packing the gold against the cement. When the first piece

of gold is placed in position, whether moss fiber, Watts' crystal, or any other form, I find it a great help to take a hot burnisher, heated beyond the boiling-point of water, and put it right against the gold. Do not press it too soon, but press gently and vibrate it. It will drive the air from the pores of the gold, into which the cement will be driven, thereby making a closer union between the gold and the cement, which will give it more

support than if pressed with a cold instrument. I do not doubt that this can be done with a cold instrument, as I have done it myself with excellent results, but I think this little point is an improvement in the starting of the filling.

I wish to differ with him in using cement as a lining to amalgam fillings. While I think results are better than where amalgam is used alone in contact with the tooth-structure, I have taken out large fillings of this character where there has been a contraction in the amalgam which affected the cement in five years after the filling was made. To avoid this I mix the cement and amalgam for the first half of the filling. I get not only a mixture, but in bringing the amalgam into contact with the cement it partakes of the nature of cement more than of the amalgam—it becomes soft, pliable, and sticky.

I made the statement a few years ago that not over fifty per cent. of the fillings inserted would not be after five years liable to criticism, even finished by the best operators in the profession. If that be the case, what can we expect of those who never do a good piece of work? I have been criticized for that remark by some, who thought possibly that I put it too strong. However, I believe the essayist is right, and I believe that the time has come when the progressive man must discard the idea of putting gold and amalgam directly against the tooth-structure. There are better methods known today, and they are being introduced here, there, and everywhere. I am getting letters every little while speaking about it and asking questions, many telling me that the method has helped them very much. I am often asked the question, Will it save time? I do not

know and I do not care whether it saves time or not; I am trying to save teeth. If we can take a little more time, and make better fillings, let us do it. In cases of thin enamel walls on front teeth, take this method; use the hot burnisher, and burnish the cement and gold to the wall until you secure a good, strong connection that will last for years, that will not disfigure the tooth or spoil the color, and that will be a beautiful piece of work, a monument to the man who does it.

Dr. A. J. CUTTING, Southington. I do not know what more I can add to the admirable paper that Dr. Head has given us and to the words of Dr. Taylor further than to show my approval of this method. I presume that the knowledge of my use of this method was what placed me on the program without my consent, as it is well known locally that I am heartily in favor of lining all cavities with cement; I have done it for many years. I recall the time when Dr. Taylor in his office showed me this method, and said he had for several years been filling teeth by inserting a lining of cement and putting in the gold or amalgam on that before the cement had hardened. He thought it original with him, as he had not found anybody else doing it in that manner. I did not know that I was doing it anybody's way, but I had been doing it for years prior to the time Dr. Taylor showed it to me, and that was a number of years ago. I cannot tell exactly how many years I have been using the method, but as time went on, in working for patients I have run across cases that were done as far back as 1892 on my own patients of whom I had kept records. However, I claim no priority in this method, for I probably took the idea from some journal, although I do not

know where or when. We all know how cement fillings save teeth from further decay, but the cement disintegrates, and I reasoned that if cement would save tooth-structure—barring washing at the cervical margin—better than any metal, then why would it not be a good idea to line the metals with it? So I did it, and as the years have gone by I have kept records of the cases, and have no reason to regret the filling of teeth in this way.

Now, I take a theoretical stand that I think is in advance of anything I have heard. As the inlay fad has come into being, we are told that teeth are being saved with these inlays better than by former methods because of the lining of cement. In lining metal fillings with cement we have been careful—I am to-day—to have all the cement removed from the margins. And why? If an inlay with the cement coming clear to the margins will save the teeth and last, then why should we be so particular to get all the cement away from the margin? For you get a connection as close with your gold and amalgam as you get with an A No. 1 inlay. I find, however, in examining inlays that are saving teeth—I find in the majority of inlays I see—that after a period of time there has been a washing away of the cement. I see some cases beautifully made, ideal cases, that do not wash out. Now, my theory is that fillings made with no line of cement at these margins will save the teeth better than the best inlay, made.

Although I may disagree with the essayist as to his statement of percentage of failures, I believe he has given us a most admirable paper. My experience would not bear out so large a percentage of failures in gold fillings *versus* amalgam in the same class of teeth. I believe amalgam is the greatest help to us

as dentists, but I do not believe personally that there is so large a percentage of failures of gold as against amalgam under the same conditions. I was very pleased with the paper. I have got into the method of using cements so thoroughly that I very seldom put in either gold or amalgam without a lining of cement.

Dr. F. L. FOSSUME, New York. In 1893, the great plastic worker, Dr. Flagg, made a statement of this method, and I have practiced it ever since, and read a paper on this subject before the New Jersey Dental Society. I have been very much surprised to find how few men use it, and many ask me if the soft cement does not destroy the cohesive quality of the gold, as is the case when gold becomes moist. It certainly does not have this effect.

Dr. L. C. LEROY, New York. With regard to this method of using cement in combination with the metals, I think Dr. Priestly of New York, demonstrated that method as early as the eighties. I remember being present on one occasion when he showed that feature of placing zinc oxyphosphate in the cavity first, and before the cement had hardened he placed the amalgam or gold. I think that was as early as 1886 or 1887.

Dr. S. C. G. WATKINS, Montclair, N. J. I used this method as early as 1886, and have used it since that time. I spoke of it before the American Dental Association soon after I adopted it.

Dr. DRAPER. Is there any danger in using the oxyphosphate so close to the pulp in a deep cavity without lining it with gutta-percha?

Dr. HEAD (closing the discussion). First I will speak of Dr. Taylor's remarks in regard to the suggestion of

heat on the cement when the gold is pressed upon it. I may say that there is a certain amount of value from pressing a hot instrument against the sponge gold, so as to slightly hasten the rapidity with which the cement sets, to prevent the rocking; but as cement when subjected to heat sets very rapidly, and since the gold would be a means of transmitting the heat to the cement, I should think that when the gold started to cool there would be no suction on the cement, particularly next to the gold, and the cement at that point would become absolutely crystallized. However, that has nothing to do with the case in point. I can imagine the hardening with a hot instrument might be a good way.

If amalgam expands or contracts to such an extent as to cause the breaking up of the cements, I should be tempted to change my amalgam. Speaking of the expansion of amalgam, I truly feel that any man who uses an amalgam made by Dr. Black's formula will have no such trouble. In any case where there is this periodic expansion and contraction, if the cement next to the tooth is going to be powdered, I cannot but feel that the contraction and expansion of the amalgam in the cement would be more disastrous because it would be exerted at greater advantage. Still, a great many good workers do use this method of putting the cement and amalgam together so as to get a mixture of the amalgam and the cement and have a certain advantage of both. It is a method worthy of consideration, and should be observed and experimented with in the future.

I want to thank Dr. Taylor for taking up my statement about the percentage of failures of gold fillings *versus* amalgams. When I made the statement that no man who had been practicing thirty

years would be able to place his hand on his heart and say that fifty per cent. of his work was still in position and free from decay, I was sincere in that statement. There may be some, however; but the only way they could be sure would be by having a set of statistics showing that half of these fillings were in the mouths of patients who had died before the fillings were two years old.

The remarks of Dr. Cutting were very much to the point. I think I said that the purpose of my paper was not for comparing the gold fillings of olden times with the modern fillings, but simply to show that the records of adhesive fillings made were of such value that we need never make any other kind. When we consider the danger of fracturing the enamel walls when hammering the gold, which is avoided to a great extent by the use of cement, I think the method is a very valuable one, because by using cement the poorest worker can make a better joint with the tooth than the best gold-worker that ever lived can make by the old method. The question of superiority of this method over the inlay is only a question of degree. The inlay lasts—we know it lasts, and in spite of the fine line, and in spite of sometimes coarse lines, it lasts, and we know that the finer the line the better it lasts, and therefore on the theory of limits, the filling that has no line at all will last the best of all. And so I bring forward this paper with the idea that I am giving you practically a gold inlay or filling that has all the advantages of the inlay combined with those of the best gold filling ever put in.

Dr. Cutting spoke of a man putting in amalgam fillings carelessly. Gold is a material that requires the nicest and most conscientious care in the world.

The man who puts in a careless amalgam filling will as surely put in a careless gold filling. He may take more care with his gold fillings because it is more difficult to do; because it may drop out. He will have to take more pains, but taking these pains will not result in as good a joint with gold as with amalgam, and it is the joint, after all, that has to do with the ultimate success.

As regards oxyphosphate killing pulps, have you ever killed a pulp with phosphoric acid? Whenever you have a pulp you want to destroy, just expose it and put oxyphosphate on it. I know that any man who has used zinc oxyphosphate knows that it is the best tooth-preserver we have. Pulps die under it, but who shall say whether the pulps die from a

previously existing infection or not. I assure you, while oxyphosphate will not bring a pulp to life again, yet it has been the experience of inlay workers for the last twenty years that oxyphosphate saves teeth; that in deep cavities it does not act as a nerve irritant, does not destroy the teeth or endanger the pulp. I can only say that the general experience of the profession at large proclaims that zinc oxyphosphate does not endanger the vitality of pulps.

The subject of Dr. Head's paper was passed.

The President announced as the next order of business the reading of a paper by Dr. S. FREEMAN of New York, on "The Use of Compressed Air in Operative Dentistry," as follows:

THE USE OF COMPRESSED AIR IN DENTISTRY.

By SOLOMON FREEMAN, D.D.S., New York, N. Y.

As there has been considerable interest manifested in the use of compressed air in operative dentistry, it does not seem amiss for me to again read a paper on this subject, which I first presented to the American Dental Association in 1895. Without any further preliminaries then, I will call your attention to the divers instruments which are used, the application of which I will explain and demonstrate in detail.

Permit me to explain the methods of producing compressed air, and the manner of conducting it to your operating chair. It is often obtained by means of a suction pump, which sucks in the air and forces it through a pipe to a reservoir. As it is necessary for our purpose to have a continuous and considerable current, I would not advise the use of a hand pump or small cylinder, as in employing them you will find that both the air and the operator become quickly exhausted. I would therefore recommend that which is known as the "Champion beer pump" or the "compound pump" of the same manufacture, for I find them the simplest in construction, as well as the most satisfactory air compressor on the market today.

Before placing the pump in your office, ascertain how many pounds of water pressure you have; if, as in my office, you have only twenty-five pounds, the Champion pump will not furnish, contrary to the claim of the manufacturers, the same amount of air pressure as water; I have discovered a loss of a few pounds. Such being the case, the compound pump (although a few pounds of pressure are also lost) is preferable, as it is frequently necessary to have the air at a pressure of forty to fifty pounds to the square inch.

This pump is connected with the reservoir, which is a tank containing eighteen or more gallons of air, tested to one hundred and fifty pounds pressure to the square inch; from this runs a quarter of an inch black-tin pipe, with branches to my laboratory and operating room. To this I have attached two gages, the first to show the number of pounds of air in the tank; the second, connected after the regulator, is to ascertain the amount of air pressure employed in the operations. The regulator is nothing more than a screw valve; as you loosen the screw you close the valve, and *vice versa*.

To the gage is connected a distributing pipe, with as many cocks as you desire, to attach the rubber tubes and cut-offs. The tubes should be of heavy rubber, so as to withstand a high air pressure. The cut-offs close automatically, and you may use the antiquated expression, "Touch the button and the air will do the rest."

Before proceeding to explain my other devices, permit me to call your attention to this pump, which I am enabled to present to you through the kindness of Mr. Clausen, the manager of the New York Beer Pump and Faucet Co. He has sent and installed this complete apparatus, which permits me to demonstrate the action of compressed air.

These pumps are a part of one of the best hydraulic atomizing outfits of which I am aware. I use the word hydraulic to designate the method in which the air is compressed, for you have single, double, and rotary hand pumps. When you are unable to procure water, the rotary pump attached to an electric motor is preferable.

In the practice of dentistry it is absolutely necessary to have the mouth in an aseptic condition. To produce this effect no doubt many of you use the hand atomizer, which by the continuous pressure of the bulb causes a slight cramp in the hand; with the compressed-air apparatus we do away with this work, you have the tube steadied, and can thoroughly cleanse the mouth or any cavity. I derive excellent results from the following prescription: Borine, 1 part; American hydrogen peroxid med. 3 per cent., 2 parts; water, 1 part. This makes an agreeable mouth-wash, applied with a spray.

No doubt you have frequently met cases where you would prefer to place the

rubber dam but owing to the patient's inability to breathe through the nostrils you have been compelled to send your patient away, or otherwise to work at a great disadvantage. How often have you cast about for a remedy? It is a simple one. A two per cent. solution of cocain placed in an atomizer, attached to your compressed-air apparatus, which is gaged at ten to fifteen pounds' pressure, and the spray thrown into the nostrils, will invariably relieve that posterior nasal catarrh or reduce the swollen tissues of the nares to such an extent that you can proceed with your work in a few minutes, without any inconvenience to your patient. In using the spray for this purpose have your patient sitting upright in the chair, the head inclined slightly forward; insert the tube horizontally into the nares, and do not apply over ten to fifteen pounds of air pressure, as otherwise you may set up an irritation in the middle ear.

In stomatitis of various kinds, the spray employed with high pressure produces excellent results. I use for this purpose the following prescription: American hydrogen peroxid med. 3 per cent., $\mathfrak{z}\text{iv}$; borine, $\mathfrak{z}\text{ij}$. Placing this in an atomizer under forty pounds' pressure, I find that in a few seconds it will produce bleeding of the sores, washing away the grayish patch; you can then see the ebullition of the hydrogen dioxide, leaving escharotic spots similar to those produced by a caustic, and accomplishing this without pain or inconvenience to the patient.

Before applying any medicines to the gums it is always necessary to have a dry surface, so that the medicament may be readily absorbed and not distribute itself over the surface of the tissue.

Before employing this apparatus I

found it somewhat difficult to obtain a dry condition of the gums in the posterior portion of the mouth; now I find it a very simple matter. By drawing back the corners of the mouth with a napkin or piece of cottonoid, and throwing the compressed air directly to the spot, it only requires a few seconds to produce the desired condition of the mucosa, and upon applying your medicines you get immediate absorption. Now I have recourse again to the air pressure, which seems to drive the medicine deep into the tissues. In periostitis I prefer to use the cold-air current, which in itself gives relief to the patient.

In this manner the application of counter-irritants, sedatives, and local anesthetics is made easy. With cocaine you do not obtain as deep an anesthesia as you do with the hypodermic injection, but with a four per cent. solution, after a short space of time I am enabled to lance abscesses without pain. If compressed air be applied at the same time as ethyl chlorid or any of its substitutes, a deeper anesthesia is obtained, and quicker results than when these drugs are employed alone.

In the treatment of Riggs' disease and pyorrhea alveolaris it is absolutely essential that every particle of deposit of whatever form shall be removed, and that the débris shall be thoroughly washed away, leaving no particles to be ulcerated out. To do this I use the Davidson spray tubes (attached to my compressed-air apparatus at 30 to 50 lbs. pressure) filled with American hydrogen peroxid med. 3 per cent., and borine, equal parts; this throws out such copious spray that it lifts the gum tissue away from the teeth, introducing the medicament directly to the seat of trouble, forcing away all foreign par-

ticles, and giving a clean, aseptic condition of the parts.

I employ these spray tubes attached to my compressed-air apparatus for introducing medicine and washing out cavities preparatory to implanting teeth, and I may be concise and say for all wounds and diseases of the oral cavity.

Having considered the advantages derived from the aid of compressed air upon the soft tissues, I will briefly state the results procured through the medium of this agent on the hard tissues—the teeth.

I am not going to detain you with a recital of the minute anatomy of the teeth, but will call your attention to the experiments that took place ten to eleven years ago, and I think it permissible to read an extract from my paper presented at that time, showing "The Use of Pressure Anesthesia."

As you are all well aware, the dentinal tubes are occupied by a soft fiber and that while these fibers cannot be considered nerves in the ordinary sense of the word, there is no doubt that they are media for the transmission of sensory impressions from the dentin to the pulp, and that the peripheral sensitiveness can be allayed by local applications.

Drs. Harlan, Kirk, and Truman demonstrated by experiment that there is an absorption of liquids by osmotic action. The former states that thymol will diffuse in moist dentin in from three to six hours at 98.4 F.; that non-coagulants, soluble in water, diffuse readily through tooth-structure—as has been shown repeatedly in experiments outside of the mouth; that oleaginous non-coagulants pass through the structure of a tooth quite slowly in the presence of water in serum albumin, and that the vaporizable portion of an essential oil will give to a

substance which it permeates the characteristic odor in from three to six hours.

Professors Kirk and Truman show by experiments that coagulants will penetrate the tooth-structure, and Prof. Truman states that "In proportion to the coagulating power of the agent will be the penetrating force independent of gravitation."

At that time these statements had awakened the profession and provoked no little discussion, although the controversial period is usually only a passing and never the most fruitful period of any new truth. After a science has gained a recognized footing it has before it its real work to do. The question arises, What can you demonstrate?

These gentlemen have established the fact that medicines will be absorbed through the tubuli *after a certain length of time*.

Now, you will remember that the glue-yielding portion of a tooth contains water to about two per cent. of the weight of the entire tooth. Bearing this in mind, let me ask you, my colleagues, what can we accomplish after the dehydration of the tissues, leaving entirely out of consideration the capillary attraction of these infinitesimal dentinal tubes? It has been demonstrated that when the water is removed from a tooth, the normal function of transmitting impressions seems to be modified. This desiccation can be accomplished by several agents—heat, cold, and chemicals.

We know that heat or cold will produce pain, and in the application of either we should proceed with extreme caution.

I use a hot-air syringe, whose chamber is filled with carbon, which is found to be one of the best materials for retaining caloric, and only requires a few min-

utes over a Bunsen burner flame to accomplish the requisite amount of heat.

With this syringe attached to the compressed-air apparatus you can so regulate the flow of air that in a few seconds you have the tooth thoroughly dry; then introduce the medicine heated to about 95° F.; again apply the warm-air current with about forty pounds' pressure, and you will be able to excavate the tooth, nor will you have any subsequent irritation. With this method it is not necessary to employ acids in introducing cocain, and in the above method you will not find your time wasted, waiting for the absorption of the medicament. You can also spray medicine into a tooth, but I would first advise the dehydration of the dentin. In the bleaching of teeth, I find by the application of hot air at a high pressure I am able to produce the required condition in one-half the usual time, as I can rapidly evaporate the hydrogen peroxid twenty-five per cent., and force it into the tubuli. It is necessary to be cautious in bleaching teeth, so as not to get them too white, as you will frequently observe them somewhat lighter colored on the following day.

In making a tooth perfectly aseptic, the same method of applying a drug as I have recommended in inducing anesthesia will give a reliable aseptic condition of both tooth and root.

For drying out root-canals by using this syringe, you can carry heated air directly into the canal, and with a high pressure you can force antiseptics through the canaliculi and tubules, rendering the tissues thoroughly aseptic.

In setting pivot teeth, we often find it very difficult to carry the cement to the upper portion of the root. In forcing it into the root-canal with a dry instrument, upon withdrawal of the latter the

cement is found adherent to it, and not to the walls of the root; but with a high pressure you can force it into every irregularity of the root, while at the same time the compressed air will dry all surrounding tissues, and you avoid the necessity of wiping away the moisture excreted by the mucous glands.

Where heat is caused by drilling, using sandpaper disks or strips, by applying the cold-air current you can work without any interruption, for it keeps the tooth at about the normal temperature, causing no irritation.

For quickening the hardening of the compound or wax impressions you will find the cold-air current of great assistance.

These methods were presented by me to the profession over ten years ago, and as I prophesied then that it would take a number of years to awaken the profession to the value of this apparatus, I am now glad to learn that a number of you gentlemen are employing these methods at the present time; and I would advise those who have not placed the apparatus in their offices to do so, and they will find considerable relief in those arduous duties that we must perform.

On account of lack of time Dr. Freeman's paper was not discussed.

The President then called for the report of the Committee on the President's Address, which was read by Dr. Gibbs as follows:

Your committee to whom was referred the President's Address would respectfully report that the address be accepted, and that the recommendation in relation to the work of the Dental Commissioners be approved by the association.

C. F. GIBBS, *Chairman*,
F. E. ROYS,
A. H. SPICER, *Committee*.

Motion was made and carried that the report be accepted as read.

Dr. EBERLE. I think, Mr. President, that it is about time that this association possessed a gavel for the use of the president, and I therefore move that the Executive Committee be instructed to purchase a suitable gavel for the use of the presiding officer.

The motion was carried.

The Secretary then read the following list of applicants for membership as approved by the Board of Censors: James M. Shay, New London; George B. Palmer, Sound Beach; Russell E. Morgan, East Norwalk; Francis D. Larson, Deep River; George E. Bolles, Danbury; Frank J. Buchanan, Waterbury; John J. Myers, Bridgeport; T. A. Ganung, Bridgeport; Thomas A. Hart, Danbury; E. Frank Cory, New Haven.

Dr. FONES. I move that the secretary be instructed to cast one ballot for the entire list of applicants.

The motion was carried, and Dr. Hindsley cast one ballot for the list of applicants, and they were declared elected members of the society.

The report of the Committee on Nominations was called for, and Dr. Eberle presented the following list of nominations:

President—Dr. E. B. Griffith, Bridgeport.

Vice-president—Dr. A. W. Crosby, New London.

Secretary—Dr. Frederick Hindsley, Bridgeport.

Treasurer—Dr. W. O. Beecher, Waterbury.

Assistant Secretary—Dr. W. V. Lyon, Bridgeport.

Executive Committee—Dr. E. S. Rosenbluth, Chairman; F. W. Brown, New Haven; C. C. Prentiss, Hartford.

Librarian—Dr. R. H. Keeler, New London.

Editor—A. H. Spicer, Westerly, R. I.

Dr. GAYLORD moved that one ballot be cast by the secretary for the entire list of nominations.

The motion was carried, and after the secretary had cast the ballot, the president declared the entire ticket elected.

The President appointed Drs. McManus and Strang as a committee to escort the new president to the chair.

Dr. JOHNSON, in transferring the office of president, said: I present you with the gavel of this society, and with it all of the honors and emoluments accompanying the office; and my only wish is that the members of this society be as loyal to you during the coming year as they have been to me during the past year.

Dr. GRIFFITH, in accepting the gavel, said: Gentlemen of the Connecticut State Dental Association,—I want to offer my sincere thanks for the honor you have bestowed upon me, and I feel that with the same help and support which has been given to each president for the past number of years the coming year will be as successful as any of the previous years. I should not feel that I could go on with the duties of the office without the full support of the members of the association. I really believe that the president is but a small part in the machinery of the society as it works today. The society seems better equipped each year to perform the duties which devolve upon us. I thank you again, gentlemen, and I promise to serve to the

best of my ability during the coming year.

Dr. JAMES McMANUS. I offer a motion that the members of the society thank most heartily the essayists and clinicians for honoring us with their presence this year and for furthering the interests of the meeting.

The motion was carried.

Dr. HENRY McMANUS. We have thanked the essayists and clinicians, and we have another body of men who have aided materially in the success of the meeting, and I want to offer as a motion that this society offer its thanks to the exhibitors, who have added so much to the success of our meetings during the last ten years.

The motion was carried.

Dr. STRANG. I would like to move that a vote of thanks be extended to the *Dental Cosmos* for sending their representative, Dr. Anthony, to report the meeting.

Dr. JAMES McMANUS. I want to amend that by adding that we thank them for the splendid reports made by the representative of the *Dental Cosmos* in the past few years, and for the pamphlet editions of our proceedings. They make a very valuable record for our society, and in the pamphlet form are very easily filed, and I think that individually and as a society we should be very thankful to the representative and to the management of the *Cosmos* for giving us such good reports for the past several years.

The amendment was accepted by Dr. Strang, and the motion was carried.

The President, after calling attention to the clinics to be held during the afternoon, declared the meeting adjourned until the next annual session.

THE CLINICS.

Dr. C. FRANK BLIVEN, Worcester, Mass. "The Correct Adaptation of Upper Dentures."

After a perfect impression has been obtained, examine the mouth for the hard places the plate is likely to press upon when in use, and cover the impression sufficiently to relieve the pressure. Proceed to pour the model, and after separating, examine the mouth for the soft places, carving sufficiently to permit the plate to rest firmly upon the tissues. The result will be a plate that will fit the mouth when in use, if the other features necessary to a perfectly constructed plate are executed.

Dr. W. S. PAYSON, Castine, Me. "A Positive Anchorage for Alloy Fillings."

The sulci of the bicuspid and molars are cut out and a double-headed brass gold-plated wire No. 38 is inserted in the sulcus and body of the filling completely covered by the alloy. The distal end of the sulcus from the filling is enlarged a little, and one head of the rivet is placed in the enlargement, the other head being in the body of the filling. This makes a sure anchorage and conserves the maximum amount of tooth-structure.

Dr. G. H. LEGGETT, New York, N. Y. "Using Rubber Teeth as Removable Facings in Bridge Work."

The shoulder of the tooth is first ground off and a backing adapted to the tooth, the holes being large enough to clear the heads of the pins easily. The backing should be of 22-k. plate, No. 30 gage. A depression is then made in a piece of pure gold with a ball-pointed burnisher, which depression acts as a trough for the pins when the backing and tooth are in place. This piece of pure gold is then burnished down and trimmed, and together with the backing is placed on the tooth. The backing and the pure gold plate are tacked together with solder, replaced on the tooth, and the tooth set up on the model, after which the facing is removed, and the bridge is invested and soldered. The facing is then cemented to position with Evans cement. The clinician claims as advantages for this method that one has a larger assortment of teeth to select from; the facings do not go through the fire; heavy tips can be put on if necessary; the facings, when broken or lost, are easily replaced by any dentist, and no special tooth is required. The color may be very much modified by the cement used.

Dr. STEPHEN PALMER, Poughkeepsie, N. Y. "Unique Porcelain Operations and Their Results."

1. Immediate correction of irregularities by the aid of porcelain veneers. The clinician showed models demon-

strating each step of this method, and asserted that in one case of this kind the teeth are as firm and perfect as the day the operation was completed.

2. Repairing of two porcelain teeth upon a continuous-gum denture. The central and lateral teeth were fractured diagonally, and the original length and contour restored by building up with inlay material, and in that way saving time and risk of removing the fractured teeth and replacing new, and has proved equally as durable.

3. Construction of a porcelain post crown upon an irregularly broken-down root, where the root of a lateral is broken diagonally with one side at least three-sixteenths of an inch above the gum margin. This piece was still in perfect condition after four years of service, and saved sacrificing either a perfect central or canine for supporting a small bridge.

4. A porcelain crown constructed over a remaining firm post of a fractured Logan, thus avoiding the removal of the post and weakening of the root in the operation, as is often the result.

5. Porcelain veneers as used to restore uniformity of shade of two conspicuously discolored teeth. This was illustrated by models showing each step in the operation, but the clinician says that the satisfactory result can only be appreciated by an examination of the completed case as represented in the mouth.

F. W. PROSEUS, Rochester, N. Y.
"The Land All-Enamel Jacket Crown
Made from Impressions and Dies."

The first attempts were made by taking impressions of the prepared tooth. Cement thoroughly incorporated with

soapstone was used, the tooth being previously wiped with a thin coating of vaselin. This method proved very good in certain cases, especially where the prepared stump was not too long. In cases of molars and bicuspidis where undercuts are present it is impracticable to get good impressions with cement, and modeling compound is employed, with results fully as satisfactory and with saving of time. The tooth is prepared as described in the *Dental Cosmos* for 1903, vol. xlv, page 444. A snug-fitting German silver band is made for a Richmond crown, but extending slightly above the sides of the root. The band must be made with straight, smooth sides to avoid undercuts which would break or draw the impression material. The object of the band is to define the circumference and force the impression material about the root. With the band in place upon the root the impression is taken. If with cement, place matrices at adjoining teeth and see that the bulk of the cement does not interfere with the occlusion. The bite is then taken with modeling compound, cooled and removed. The impression should come away with sharp, clear edges; place in the compound with the band. A ring one-half inch high of unvulcanized rubber is formed about the cement and band, and a die of Melotte's or fusible metal poured into this. The rubber is then removed and a plaster cast is run. In using modeling compound the band is placed in position and a well-warmed piece of compound is used, and pressure made with the thumb and fingers to force it firmly to place until set. It is then thoroughly cooled and a bite is taken with another piece the surface of which has been heated over the flame to produce adhesiveness. After

cooling and removing, amalgam, rather soft, is pressed into the space within the band and plaster model. The matrix is made and the jacket completed entirely independent of the patient. By this method a great saving of time is assured, and should the jacket become checked or broken there is no annoyance to the patient in making the second one. Also after the first baking the matrix is replaced upon the model and the body firmly pressed in, then carved to the desired shape, thus giving stronger porce-

lain than is produced by flowing and tapping to place.

In making the larger posterior molar jackets, first make a matrix of thin metal, not being especially particular about its accuracy, and over this on the die press the body and carve to shape and biscuit to slight glaze, strip out the matrix, then form a true-fitting matrix and into the partly formed jacket place quite wet body, and press firmly to place. This saves time and overcomes warping, and assures a true joint.

TRANSACTIONS

OF THE

Connecticut
State Dental Association

AT ITS

Forty-second Annual Convention

HELD AT

BRIDGEPORT, CONN.

April 17 and 18, 1906.

PHILADELPHIA :

THE S. S. WHITE DENTAL MANUFACTURING CO.

1907.

T R A N S A C T I O N S

OF THE

Connecticut
State Dental Association

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TRANSACTIONS

OF THE

Connecticut State Dental Association,

AT ITS

FORTY-SECOND ANNUAL CONVENTION,

HELD AT

Bridgeport, Conn., April 17 and 18, 1906.

TUESDAY—Morning Session.

THE forty-second annual convention of the Connecticut State Dental Association was called to order on Tuesday morning, April 17, 1906, at 10.30 o'clock, in the convention hall of the Y. M. C. A., Bridgeport, Conn., by the president, Dr. E. B. Griffith of Bridgeport.

The first order of business was the reading of the minutes of the last meeting.

Dr. G. O. McLEAN moved that the reading of the minutes of the previous annual meeting be dispensed with, inasmuch as they had been published in full in the Transactions, of which a copy had been sent to each member of the society.

The motion was carried.

Dr. JAS. McMANUS, in behalf of the members of the society, then presented to the president a handsome ebony gavel.

The PRESIDENT, in accepting it, thanked the society for its kind remembrance of him as its presiding officer.

The next order of business was the reading of the report of the treasurer,

Dr. W. O. BEECHER, Waterbury, as follows:

TREASURER'S REPORT.

WATERBURY, CONN., April 16, 1906.

Balance on hand April 17, 1905.....	\$296.26
Received for dues to date.....	310.00
“ “ eighteen new members..	90.00
“ from Dr. G. O. McLean (exhibitors)	379.50
Received from Dr. E. S. Rosenbluth (exhibitors)	192.00
Received from Dr. F. Hindsley (advertising)	105.00
Total	\$1,372.76
Expenses to date.....	814.13

Balance	\$558.63
Balance on hand as per bank book....	558.63

Respectfully submitted,

W. O. BEECHER, *Treasurer.*

On motion by Dr. Strang the report of the treasurer was accepted.

The secretary, Dr. HINDSLEY, then reported that the Board of Censors had recommended that Dr. A. E. Duval, Hartford, Conn., against whom charges of

unprofessional conduct had been preferred, be expelled from the society.

Dr. McLEAN moved that the action of the Board of Censors be approved and that Dr. Duval be expelled from the society.

The motion was carried.

Dr. HINDSLEY then reported in behalf of the Board of Censors that the following applications for membership had been acted upon favorably by the Board: Frederick Arthur Scott, Woodbury; Chester Milton Scripture, Bridgeport; Robert Hallock Wright Strang, Bridgeport; Charles Rushing Uhle, Bridgeport; Arthur M. Hunter, Bridgeport; Wm. T. Casey, Bridgeport; Geo. Walker Cairoli, Bridgeport; John S. Cairoli, Bridgeport; Walter David Bray, Hartford; William Bradley Wheeler, Westport; William S. Gibb, New Haven; Edward L. Richards, New Haven; George Christopher Fahy, New Haven; Frank P. McEnerney, New Haven; William B. Brewster, Waterbury; E. W. Moyer, Waterbury; Emil R. Patzold, Waterbury; Henry H. Gorton, Naugatuck; Fritz Julius Swanson, Ansonia; Benjamin Hoyt Keeler, New Canaan; Willey T. Smith, Winsted; James H. Weeks, Jr., Stonington; William Wheeler Leonard, Jewett City; George S. B. Leonard, Mystic; Charles Pratt Blinn, New

Milford; David Banks Hawley, Long Hill; Frank B. Hoyt, East Norwalk; Albert H. Spieer, Jr., Westerly, R. I.

Motion was made and carried that the entire list of applications be acted upon at one time, and that the secretary be empowered to cast the vote of the society for the entire list.

The motion was carried, and the entire list of applicants was declared elected to membership.

Dr. F. T. MURLLESS, Jr., then presented the following resolution:

RESOLVED, That the following become Article X of the by-laws of the Connecticut State Dental Association, that the present Article X be made Article XI, and succeeding articles be renumbered to correspond:

"No dentist or physician who is not a member in good standing in his own local or state society shall present either a paper or clinic before this association, or take active part in the proceedings."

Dr. JAMES McMANUS moved the adoption of the resolution, which was, according to the by-laws, laid over until the next regular meeting before being passed finally by the society.

Dr. A. W. Crosby, New London, vice-president, took the chair, and President Dr. E. B. GRIFFITH read his annual address, as follows:

PRESIDENT'S ADDRESS.

By E. B. GRIFFITH, D.D.S., Bridgeport.

ANOTHER year has passed, and it brings us to the forty-second milestone in the history of our society. It is my happy privilege to preside over the deliberations of the Connecticut State Dental Association, and doubly pleasing from the fact that Bridgeport is for the first time honored with this gathering of gentlemen who unselfishly seek to advance and uplift the standard of their chosen profession. I bid you all a most hearty and sincere welcome.

In these days the "President's address" occupies a small part in the affairs of our conventions; and I shall not depart from the precedent established. However, there are a few thoughts which I wish to express briefly as possible. The energy, enthusiasm, and determination of the officers and members have placed this association in the foreground of dental societies, and the membership may feel a just pride in the advancement made. We should not be content with present conditions; it should be our purpose to offer more attractive meetings each year, thereby making the meetings of greater value to all who attend. The membership, which is large at present, should be greatly increased, and loyalty to this society should be paramount. In these times of enthusiasm and zeal we

are liable to reach out and develop. As a result of this we have at the present time five local societies in the state, each accomplishing the purpose for which it was organized. Surely this is a gratifying condition of affairs and deserves to be encouraged in every way. To the young man entering the profession it means much of benefit. Any society having for its object to cultivate the science and art of dentistry and all its collateral branches; to elevate and sustain the professional character of dentists; to promote among them mutual improvement, social intercourse, and good feeling—to obtain membership in such societies is the duty of every practitioner who seeks to elevate professional dentistry. The sacrifice we make in our local societies will strengthen the state association. Above all, we cannot but acknowledge the fact that this parent society, with its many years of successful work, is and will continue to be the leader in thought and influence throughout the state.

Since our last convention, by an enactment of the House and Senate, we have come into possession of a new dental law. It is not my purpose to take up the bill in detail. This much may be said: It was impossible to secure the passage of

the original bill as drafted; much was accomplished, however—enough to bring adequate return for the time and effort so fully given by many of the members of this association. Great satisfaction comes to us as we realize that Connecticut, by the passage of a better dental law, has secured higher rank in the profession. Under the old law the Board of Dental Commissioners, through no lack of interest or effort on their part, found it impossible to secure assistance in prosecutions, although self-sufficient evidence was at hand. Now the matter is entirely in your hands, gentlemen, and you are responsible for any illegal practice. You have but to interest yourself in the section where you reside, and present evidence of a positive character to your county health officer, and—judging from the record so far established in this county—illegal practice will be suppressed. Let me emphasize again that each and every member of this society is responsible for any violation of the law; the State Board cannot be held responsible; they are anxious and willing to do their part, therefore we must not shirk our duty.

It is a deplorable condition that such a small number in the profession interest themselves to lend their support to the work of the National Dental Association. Dr. Kirk states that scarcely two per cent. of the dental profession in the United States attend the National meetings. The Northeastern Dental Association should appeal to the profession in New England far more than it does, for if we are to be progressive it is absolutely necessary for us to identify ourselves with all dental associations of a helpful character.

A matter which should be of interest to all is Senate bill No. 2355, being a bill

to reorganize the corps of dental surgeons attached to the medical department of the army. A hearing was held before the subcommittee of the Senate on January 17th. A goodly number attended, including the following: Charles E. Munroe, Ph.D., representing the George Washington University; Rev. David Hillhouse Buel, S.J., president of Georgetown University; George Tully Vaughan, M.D., assistant surgeon-general, Public Health and Marine Hospital Corps; Joseph Wall, M.D., professor of physiology, Georgetown University; Edward C. Kirk, representing the University of Pennsylvania; B. Holly Smith, M.D., D.D.S., representing the Baltimore College of Dental Surgery; M. F. Finley, D.D.S., president of the National Dental Association; H. E. Kelsey, D.D.S., president of the Maryland State Dental Association; H. H. Street, D.D.S., member of Maryland State Dental Association; Williams Donnally, D.D.S., chairman of the National Dental Association Committee on Dental Legislation—all of whom participated in the hearing. Later reports are most assuring, as the following will show. Senator Pettus, chairman of the subcommittee, reported back to the Senate February 1st, as follows:

The Committee on Military Affairs, having examined the provisions of this bill, respectfully recommend that it do pass.

* * * * *

Col. Marion P. Maus, chief surgeon, says:

"It was almost impossible to realize the great benefit which resulted to the troops from this department, located, as they were, in the field. Engagements were made as in civil life, and both dentists were kept busy from early morning to late in the night. I was informed by the dentist that he was unable to attend to half of the calls that were made on him.

"In my opinion, every corps should be provided with a dental department, consisting

of one chief dentist with the rank of major, three dentists with the rank of captain, and three assistant dentists with the rank of first lieutenant."

* * * * *

The Committee on Military Affairs, by a subcommittee, took testimony on this bill, and the hearings before that subcommittee are herewith submitted. Several great educators were examined, and the testimony thus taken proves that in the principal universities and colleges of the United States dental surgeons and medical surgeons are educated alike, and in most of these great places of learning an academic course is required of each of the students in each of these learned branches before entering upon their professional education; so the dental surgeon in the United States is educated as well as the medical surgeon, and he is required to devote as much time to his education before he graduates as a dental surgeon as the medical surgeon is required to devote to his education before he graduates. It cannot be claimed either that as citizens or as members of society there is any real difference in their rank; in fact, the great medical society of the United States is composed of dental surgeons as well as medical surgeons, yet in the army dental surgeons have no rank. It is no military offense for a private in the ranks to grossly offend a dental surgeon, and that has been decided by the military courts.

Senators who have served in any army of the United States know what importance is attached and should be attached to military rank. Chaplains have military rank, and they should have it. Quartermasters have military rank, and it ought to be given to them. Commissaries have military rank, and they need it. Physicians have military rank, and they also need it. Quartermasters and commissaries require, to fit them for their office, a business education and not the years of learning which is necessary to qualify a man for one of the learned professions. Your committee are of the opinion that great injustice has been done by the law of the land in reference to dental surgeons. They are not even entitled by the customs of the army to associate with commissioned officers, though they may be admitted as a matter of courtesy, and they should have a right to

such association. By the customs of the army dental surgeons, though they have no right to associate with commissioned officers, would not be allowed by such commissioned officers to habitually associate with the rank and file, for if they did so they would lose caste.

In a bill favorably reported by this committee on the recommendation of the War Office, it is provided, "That, to increase the efficiency of the army," the number of medical surgeons be increased so as to take the place of contract medical surgeons, because rank would make such surgeons "more efficient," and no doubt it would.

So much has been said the past few years regarding reciprocity between the various states, not only in our own profession but also in the medical profession, that I believe the time is near at hand when the passage of laws practically uniform in requirements will permit of interchange. It is true that but few practitioners would find it necessary to avail themselves of such an opportunity; however, the injustice of our present laws is apparent to the profession. First of all it is necessary that there should be more advance in educational work, and the profession looks to the National Association of Dental Faculties and the National Association of Dental Examiners to bring about better conditions. Already the Faculties Association have submitted a proposition that a board of ten regents be appointed for life, seven from the colleges and three from the Examiners' Association, who shall formulate a uniform system of education that can be accepted by both the colleges and the examiners.

Departing somewhat from the usual custom, our efficient secretary has furnished us this year with a more elaborate program; no doubt this will be appreciated by the members. It is certainly gratifying to the Board of Censors, not only for its completeness and beauty, but

also as being a source of revenue to the society.

It is my belief that dental societies will be compelled in the near future to meet a new condition. Each succeeding year our conventions bring additional work and expenditure of moneys in the carrying on of a successful meeting. In the past the exhibitors have added largely to the amount in the treasurer's hands; but it appears from present conditions that this source of revenue will be considerably diminished, and most likely in another year fewer still will secure space. The policy of advancement adopted by this society cannot be changed. How are we to meet this new condition? It will be necessary to give this subject very careful consideration. May I be allowed in expressing my own convictions to say that I consider it of great benefit to the profession to be entirely independent of any source of revenue outside that received from its membership? The sooner we eliminate the trade feature from our conventions the better for the dental profession. If this society be the first to adopt a higher professional standard in conducting the business side of its conventions, then we should be proud of our effort. I would therefore recommend to the members of this society that we amend Article IV, Section I of the By-laws, to read as follows:

"Active members shall sign the constitution and pay an admission fee of five dollars (\$5.00); the annual dues for each succeeding year shall be five dollars (\$5.00), payable in advance."

Much might be said of the advancement made by the profession along scientific lines. Each year we are broadening; the journals every month are full of valuable papers touching upon all branches

of dentistry, and I deem it unnecessary to more than mention that subject at this time.

And now in conclusion, gentlemen, I wish to say that whatever measure of success may be derived from this convention is due largely to the untiring efforts of the several committees who have labored so faithfully, and I desire to take this opportunity to express my thanks for the hearty co-operation which they have extended to me at all times; it has been a real pleasure to meet with them.

We have tried to furnish the very best in the way of essays and clinics, and it is our hope that the meeting will be of benefit to all who attend. Let us be considerate and charitable; may harmony and good-will prevail at all times. I assure you that my purpose will be to preside over the sessions of this convention to the best of my ability, with due consideration for every member.

After considerable discussion of the recommendations made in the President's address, it was on motion referred to a committee of three, which was requested to report upon it before the closing session. (Discussion by Drs. Geo. O. McLean, C. B. Adams, E. S. Rosenbluth, James McManus, E. B. Griffith, W. O. Beecher, and A. J. Flanagan.)

Dr. Crosby appointed as the Committee on the President's Address: Drs. C. W. Strang, E. S. Gaylord, and H. G. Provost.

The President resumed the chair.

The next order of business being the nomination of officers, Dr. Strang moved that a nominating committee be appointed by the president to present nominations to the society at a later session.

The motion was carried, and Dr. Grif-

fith appointed the three previous presidents of the society as the nominating committee: Drs. Edward Eberle, G. O. McLean, and D. W. Johnston.

Dr. PROVOST moved that a committee be appointed to voice the appreciation of the Connecticut State Dental Association to Senator Bulkeley for his efforts in behalf of the army and navy bills.

Dr. JAMES McMANUS offered as an amendment that the secretary be instructed to express the thanks of the association to Senator Bulkeley.

The amendment was accepted and the motion was carried.

There being no other business at the time, the society adjourned until the afternoon session.

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TUESDAY—Afternoon Session.

The second session was called to order by the president, Dr. Griffith, Tuesday afternoon at 4.30 o'clock.

The first order of business was a lec-

ture by Dr. E. C. KIRK, Philadelphia, Pa., on "Chemical Principles Involved in Tooth-Discoloration," a summary of which follows:

CHEMICAL PRINCIPLES INVOLVED IN TOOTH-DISCOLORATION.

By EDWARD C. KIRK, D.D.S., Sc.D., Philadelphia, Pa.

ATTENTION was called by the lecturer to the well-known fact—which had been observed as early as 1839 by Dr. Chapin A. Harris, and frequently since then—that the teeth of animals as well as of human beings who had been killed by strangulation—as in hanging—or by blows upon the head or sometimes from gunshot wounds in the head, became of a pinkish tint shortly after the traumatism had been inflicted. This phenomenon in the early days was believed to have established the theory that there was a vascular circulation in the dentin, and further that the dentin was a vital tissue. Our later histological studies of dentinal structure, and also of the histological and chemical character of the blood, has given us the basis of a more rational explanation of the phenomenon of pink discoloration of the teeth in the cases referred to. It is now known that the pink staining of the tooth is brought about by a rupture of the stroma of the red blood-disks, liberating the contained hemoglobin, which dissolves in the plasma, forming a solution of hemoglobin which readily penetrates the dentinal tubuli, the lumen of which is of insufficient diameter to admit the unbroken red

corpuscle. This pink discoloration resulting from the infiltration of hemoglobin solution represents the first stage of tooth-discoloration. The same conditions may also be brought about by the injudicious application of arsenous oxid for the purpose of pulp-devitalization, especially in cases of minute pulp-exposure, the arsenic acting as a violent irritant, producing sudden congestion with rupture of the corpuscular stroma and liberation of its contained hemoglobin. Certain other agents, as for example, nitro-glycerin, when employed in connection with cocaine solutions, may bring about the same liberation of hemoglobin, producing what is commonly known as hemolysis, with consequent staining of the dentin, when such solutions are applied topically to the exposed pulp preparatory to its eventual extirpation.

The pink stain rapidly undergoes alterations, later on assuming a brownish tint, due to the breaking down of the highly complex molecule of hemoglobin into a reduction product known as hematin. Illustration of the changes referred to was made by adding a small quantity of sulfuric ether to several ounces of defibrinated bullock's blood, the ether

causing the rupture of the corpuscular stroma and the liberation of the hemoglobin and its solution in the plasma, producing that change known as laking of the blood, as described by physiologists. The difference in the appearance of the laked blood and the whole blood was shown by samples of each placed together for purposes of comparison. The reduction of the hemoglobin to hematin was shown by the action of dilute nitric acid upon the film of laked blood spread upon blotting paper. The acidified area was instantly changed in color from the characteristic red to brown.

At this stage the effect of hydrogen dioxid solution as a bleaching agent upon the hemoglobin and hematin surfaces respectively was shown by brushing hydrogen dioxid solution across both, the result being that the hemoglobin stain was bleached quite rapidly, whereas the hematin stain showed no response to the action of the bleaching agent. From this it was deduced that the tooth could be more readily bleached by hydrogen dioxid in the pink stage of discoloration; and second, that care should be exercised to use an alkaline or neutral solution of hydrogen dioxid in the bleaching process, as any free acid would have the effect of reducing the hemoglobin to hematin, and thus increasing the resistance of the stain to the action of the bleaching agent.

The relative effect of sodium dioxid, of chlorin, and of hydrogen dioxid respectively were shown in the capacity for bleaching the hematin stain, with the result that the most rapid bleaching effect was produced by chlorin, the next by sodium dioxid, and the slowest by hydrogen dioxid.

The lecturer called attention to the principle that the bleaching process was

to be regarded merely as a means for so altering the composition of the color molecule that the resulting compounds should be colorless, and to the further fact that bleaching by no means removes from the texture of the tooth all of the elements concerned in the production of the original stain; it merely alters their chemical relationship, hence definite steps should be taken to prevent a future return of the discoloration, either by removing in soluble form all the residual compounds produced by the bleaching process, or else by so hermetically sealing them into the tubuli with an impermeable material that oxygen or moisture cannot come in contact with them and bring about future alterations which might result in the formation of color-producing compounds.

Attention was directed to the fact that iron is a characteristic component of hemoglobin, and that notwithstanding the fact that the dioxids will bleach hemoglobin and its derivatives, producing colorless compounds with the iron element, the iron still exists in a colorless combination in the bleached stain. This fact was demonstrated by applying to a bleached surface the usual reagents for the chemical detection of iron, with the result that its presence in the bleached tissue was proved by the characteristic iron reaction obtained. As a means of overcoming the tendency toward a re-discoloration of the bleached tooth two methods were recommended: First, bleaching by chlorin, whereby the iron is converted into soluble chlorid, when it can be washed out of the tooth-structure by copious irrigations of hot distilled water after the bleaching process has been applied; second, where the tooth has been bleached by any of the dioxid methods, thorough desiccation of

the tooth-structure by hot air, and filling the tubular structure with paraffin solution or a solution of copal in ether.

The lecturer strongly advocated a more thoughtful consideration of the tooth-bleaching operation as a conservative procedure in dentistry, and deplored the too frequent solution of the discolored-tooth problem by the mechanical substitution of an artificial crown for the discolored

tooth, which procedure, in view of the success to be obtained by the intelligent application of bleaching methods, could only be regarded as a confession of incompetency upon the part of those who were willing to sacrifice the useful natural crown and to replace it by an artificial substitute simply because of lack of familiarity with the bleaching process.

DISCUSSION.

Dr. M. L. RHEIN, New York, N. Y.
Mr. President, ladies and gentlemen: I believe I echo the sentiment of everyone who has listened to Professor Kirk's remarks when I say that we all appreciate the value and delicacy of the experiments which he has just made.

The time I think has long since passed when the cutting off of crowns for this purpose can be considered a permissible procedure. I might add to the sentiments to which we have just listened in regard to the objection to this procedure, by referring to another phase of the question of crowning a root, whether it be with a shell gold crown in the case of posterior teeth or with a porcelain crown in the front ones. This operation means decidedly more than the mere loss of the exposed portion of the tooth-structure necessary in order to insert such a crown properly.

It is necessary for me to call your attention to the amount of work performed upon the root of the tooth itself, around the outer periphery of the periodontal tissues, an operation that weakens the root—the real mainstay of every

tooth. For my part, I believe that the most valuable aid that the inlay—whether porcelain or gold—has given to dentistry in the last few years has been in its tendency to do away with so much of this radical crowning of teeth, because it enables us to save more of the vital part of the tooth, namely, the root itself, which, as I have already stated, is the mainstay of the tooth whether it contains a pulp or not. The important thing to achieve in the ordinary discolored tooth is that it should be bleached and not cut off and crowned, because the length of life of the root itself is always lessened when we have to resort to this radical procedure.

The remarks that we have listened to are certainly in accord with my experience in regard to the ability to bleach teeth thoroughly at the very moment of the accident, and the great difficulty encountered a short time afterward—when the hematin discoloration has taken place—in accomplishing the same results; and then again, the ease with which the tooth is bleached after it has been discolored for a number of years. I was reminded

in a humorous way, in listening to Dr. Kirk, of a candidate who, being examined before a dental licensing board, when asked how he would bleach a discolored tooth, said he would first send the patient home for five years and afterward bleach the tooth in the ordinary manner. I want to say in regard to this hematin stain—and I very likely echo the sentiment of many others—that it has given me considerable difficulty. Now, what Dr. Kirk has told us resolves itself into one main point, namely, that a certain amount of the substance of the blood becomes impregnated in the dentin of the tooth itself, and that in order to obtain permanent bleaching results we must remove that substance entirely or we will not have accomplished our object.

My efforts in this direction have consisted in removing as much of this iron compound as possible, by cutting very freely into the tooth. I recognize the objection that is certain to be brought against this free cutting in the interior of the pulp-chamber, and perhaps the root-canal, and the danger—for there is a certain amount of danger—of a subsequent fracture of the tooth. Of course in following this method the operator has to exercise due caution as to how much of that excavating he can safely do, in view of the method of restoration that he will pursue. I have had very few disappointments to call my attention to the danger resulting from this practice; I am only putting this side of the picture forward because I recognize that such is the criticism which will be made against the method. The point I have in view is the free removal of this iron compound, and the cutting far enough into the structure to remove as much of it as possible. I have never been able to clear up a tooth discolored with hematin

stain in any other way than by this very free cutting, and I have bleached a great many in that way; very successfully, too.

I recall the case of a young man who came to me about two years ago. While bicycling in the Adirondacks, he fell accidentally, and split off the two corners of the central incisors. It was about four weeks after the accident before I saw him, and he very graphically told me that the teeth had been a beautiful pink the first few weeks after the accident, and that afterward they had turned brown. I said, "Yes, if I could only have seen the teeth immediately after the accident we would never have had much difficulty in bleaching them." Well, I had to cut freely into these teeth before I was able to obtain the results that I wanted. I finally succeeded in reaching the limit of the zone of the iron stain. They were restored with porcelain corners, and since then, although I have watched them very closely, I have failed to notice the slightest return of the discoloration. I recognize the danger, but it is one that depends upon the ability of the individual operator to avoid.

Those of you who heard my paper a year ago on the treatment of root-canals will remember how I emphasized the point that the method which I have demonstrated is of importance in relation to the bleaching of teeth. It has great value, especially in those cases where the discoloration has reached the stage where the dark stain is pronounced. The sodium and potassium compound, by virtue of its power to combine with any organic material in whatever stage it may be, whether living or dead, has the power of decomposing every particle of organic tissue with which it comes in contact; and during the thirteen years that I have used this preparation constantly I have

failed to hear of any case of discoloration of the tooth following its use, which is due entirely to the power of the kalium-natrium preparation to destroy every particle of organic tissue. This is the secret of the method. The discolored material, whether it be hematin, or whatever it be, is deposited in the organic tissue. It cannot penetrate into the inorganic tissue, because the latter is too dense for the pigment to penetrate it to any considerable distance. This preparation permeates whatever organic matter it may encounter, and the secret of success with this method lies in the amount of sodium and potassium the operator is willing to use; or, in other words, the amount of time one is willing to devote to the introduction of the sodium and potassium in order to give the compound sufficient time for it to unite with the organic tissue, which extends out into the canaliculi of the root itself.

Dr. C. W. STRANG, Bridgeport, Conn. I have occasionally had cases in which were present exactly those conditions which have been referred to by Professor Kirk. Only about a year and a half ago, one of my patients—a young man perhaps sixteen years of age, who was away from home at school in a city on the Hudson river—unfortunately was struck by a baseball on the central incisors. When he came to me the right central was of a beautiful cranberry color, the accident having occurred about ten days before. There had been but little discomfort, except that both of the centrals were tender, but when the patient saw that the right central was beginning to show signs of discoloration he became alarmed, and came to Bridgeport for treatment. I knew of course the condition of the case, and I know better now what course I would pursue in the treat-

ment of a similar case. I opened the tooth on the lingual surface quite freely, and removed the pulp. It was entirely devitalized, of a very dark red color, and came out in one mass, the operation causing little or no pain to the patient. My first application was of hydrogen dioxid, but it did not remove the discoloration satisfactorily, though it did improve the appearance of the tooth. I kept up the treatment for a week or so and dismissed the case temporarily, after closing the apex of the root. I had great difficulty in removing the discoloration to an extent that was satisfactory to me. I used hydrogen dioxid, calcium hypochlorite, ether, chloroform, alcohol, and one thing and another, and kept the treatment up for several days, closing the tooth again. I saw the case two or three months afterward and gave it another treatment similar to the first, and while there was some improvement after the second treatment, the tooth remained in a condition that might improve, I think, as time goes on.

I remember the very first case that I ever saw of pinkish discoloration, many years ago—I think about thirty. It was that of a right central incisor, which had been filled a number of months previous to the case coming to my hands, and that tooth is in place today. I have during the last two or three years urged upon the patient the advisability of removing the crown and having an artificial porcelain crown adjusted in its stead, and it was only recently I obtained the consent of the patient to have the natural crown removed. But at the time of the appointment the patient had an attack of influenza, the operation was postponed, and the natural crown is still intact, but quite dark now.

Dr. J. E. NYMAN, Chicago, Ill. I could not help thinking while listen-

ing to Dr. Rhein's discussion that it would be a dangerous procedure to cut away the root, as he says he does.

Dr. RHEIN. I did not say cut away the root, but the crown.

Dr. NYMAN. I misunderstood Dr. Rhein's statement. But still in that case it seems to me there would be considerable liability to fracture, even of the root.

I apprehend that in many cases where we find the discoloration in the incisal edge of a central incisor worn down to where the dentin is exposed, we have some difficulty in imparting the proper color to that tooth. Those are the cases where I have met with unfortunate results. Like everyone else, I have had cases where I have bleached teeth most successfully, and on the other hand I have had cases in which the results were such that I thought I knew very little about it, and demonstrated to the patient that I knew even less. Now Dr. Kirk in the last few years has succeeded in explaining to me why I was successful in some cases and decidedly unsuccessful in others. I think our only hope of success in bleaching teeth is in making a definite diagnosis of the conditions, and differentiating the cases which present themselves, not attempting to classify all these conditions under one head. Dr. Kirk's effort in the last few years has been to classify the pathology of these different conditions, in order to permit us to make a differential diagnosis of each case, and to follow the proper treatment with successful results.

A MEMBER. Dr. Kirk spoke of concentrated solutions of hydrogen dioxid. I would like to know whether he uses the twenty-five per cent. solution or whether he uses the concentrated solution in any other way.

Dr. KIRK. I have used both methods,

the ethereal solution and the aqueous solution. In a desiccated tooth the aqueous solution is in my judgment the one to be used. On the other hand, when attempting to bleach a tooth with the natural moisture present, I have resorted to the ethereal solution, because an ethereal solution readily parts with its hydrogen dioxid, giving it up to the moisture in the tubuli, the H_2O_2 having a greater affinity for water than for ether. The choice therefore depends on whether the tooth is moist or dry. There is but little difference, although the advantages are in favor of the aqueous solution in the desiccated tooth and the ethereal in teeth where the natural moisture is present.

Dr. C. C. PRENTISS, Hartford. Dr. Kirk speaks of the hematin discoloration and hemoglobin discoloration. There is a third discoloration which gives us considerable trouble.

Dr. KIRK. There are half a dozen others.

Dr. PRENTISS. There is a discoloration which takes place on the external surface of the teeth, and I should like to hear Dr. Kirk say something in reference to it. It first starts on the tooth-structure as a brownish discoloration which rapidly spreads all over the tooth. I have named it for want of a better name *saprogenous* disintegration, and I have never been able to do anything in the way of removing it, except by cutting away the tooth-structure thus affected. I would like to hear what Dr. Kirk has to say about those cases.

Dr. KIRK. Of course the type of discoloration to which Dr. Prentiss has referred is very well known to all who have frequently observed cases of tooth-discoloration. Just what it is I do not know. I suspect, however, that what is implied in Dr. Prentiss' terminology is

along the correct line of reasoning; that is, that the decomposition of some organic matter on the tooth is the cause of the trouble. Whether it is absorbed from the outside, or whether it is decomposed matter in the tooth, I do not know. It is probable that it is due to some organic decomposition. Of course there is a possibility of absorbing all kinds of materials through the dentin, from foods, etc., taken into the mouth. We are all familiar with the brown stain which occurs in the mouth of the smoker. Let me say in regard to smoker's stain, that tobacco will stain the dentin, but we have seen these stains in the mouths of individuals who do not smoke or use tobacco, women for instance. I saw such stains, in Boston not long ago, in the mouth of a lady who I am sure does not smoke. The labial surfaces of the incisors were denuded of enamel, and the teeth were badly stained. Now, the most hopeful thing that has been done with these cases is that suggested by Dr. Head of Philadelphia. Dr. Head found that by taking a strong hydrogen dioxid solution, put on thin tissue paper and applied to the tooth, and then with a hot instrument steaming or frying the hydrogen dioxid into the tooth, he was able to reach these stains. As a rule, they do not penetrate very deeply into the tooth-structure, but I have seen some cases where it seemed to follow right down the line of distribution of the dentin fibers almost to the pulp-chamber. In the class of cases referred to by Dr. Nyman, our only recourse is to bleach the case by Dr. Head's method of steaming the application through the thin desiccated structure, and then attempt to plug up the open ends of the tubuli and seal the application into the tubuli at this temperature. That is the most hopeful suggestion I have to offer.

I do not consider this a final settlement of the problem. Dr. Head has bleached many cases in this way, and I have bleached some myself, but these brown stains upon the external surfaces of the teeth are entirely a different proposition from the one which we are studying here.

I may say in regard to this subject, that the question of discoloration of the teeth and its treatment occupies my attention during several lectures to my classes, and my talk today has necessarily been only superficial. This is a profound problem, and one that requires considerable study, and I could do no more than to call your attention to the main principles, in the hope of awakening further interest in the subject.

Dr. A. J. FLANAGAN, Springfield, Mass. Dr. Kirk spoke only in a very limited way of the discoloration caused by metals. I believe there is no discoloration from pure platinum. I would like to know if he has had any experience with discoloration from iridio-platinum?

Dr. KIRK. I don't think it is possible. It is not, on any theoretical ground, because iridium and platinum are equally refractory toward any chemical agents except the halogen group; outside of the halogen group there is not a single agent that I know of that will act upon platinum or iridium.

Dr. FLANAGAN. The reason I spoke of that is because it seems to me, from the scientific and logical demonstration here this afternoon, that we as dentists are perhaps not protecting the best interests of our patients when we use base metals in pins of teeth or crowns. It is a well-known fact that we frequently have to build out the corner of a tooth, and that in doing so we often have to use a metal pin in order to secure proper anchorage for the filling. It is also a

well-known fact that many times the cement which we put into the anterior teeth is mixed with a steel instrument. Now, as Professor Kirk says, discoloration may result from even steel instruments used in mixing cements. If this is a possibility, what may we expect from base-metal pins used in crowns, or for the attachment of gold fillings in building up the corners of teeth? I think that we have a duty to perform—especially at the present time, when the products of so many manufacturers are supplied with base-metal pins. At the present time the pins of a vast majority of the teeth and crowns—and I speak from information gained from men who are engaged in the dental manufacturing business—are made of base metal. Such pins are very liable to cause discoloration, whereas if we used pins of greater cost, and made of platinum or iridio-platinum, this liability to discoloration would not exist. It appears to me that our duty to our patients demands that we use metal pins that will not cause discoloration, be the cost what it may, especially in crowns for the anterior teeth. We many times pride ourselves on the integrity and worth of our profession, but before we can justify ourselves in the use of base metals in the mouth, science must prove that base metals are the best. Let us reason honestly: Think you that base metals are used because of their superiority over platinum or iridio-platinum? Thinking men in our calling usually reason that base metals are used simply because of their cheapness—and yet we pride ourselves on our high professional standing!

Dr. NYMAN. I realize that I may have done Dr. Rhein an injustice. He is quite right in suggesting that we remove surgically all of this discolored material

which is not essential to the tooth, and I know Dr. Rhein would not do this in an injudicious manner. There is no question that this is good advice, as it leaves less of the material which is discolored, and affords less liability to re-discoloration, and furthermore we can work to better advantage from freer access to the tooth. Dr. Rhein's advice is quite timely, only it has been my practice to cut out this material before I bleach the tooth at all. I cannot see the logic of bleaching it first and cutting it out afterward.

Dr. RHEIN. If I allowed anyone to understand that I did the bleaching before the cutting, it was unintentional. In the first place, I want to amplify one point. The use of the sodium and potassium for the removal of the organic tissue I continue uninterruptedly until I feel that I have removed every particle, and I have before that used the bur freely. The cutting is done before I resort to chemical means to continue the work of removal of the organic tissue. I first do a very liberal amount of cutting. I speak of this in an apologetic tone because I believe I cut four or five times more freely than is done in most teeth by other operators. I certainly did not intend to convey the idea that no cutting was done before I used the sodium and potassium compound. I do not use any hydrogen dioxid preparations until I have finished with the sodium and potassium. In the ordinary course of work I continue with the sodium and potassium until I have finished with that part of the operation, because my experience has led me to believe that it is almost impossible to get the sodium and potassium preparation to work as efficiently in its destruction of the organic matter after I do the bleaching. The bleaching pro-

cess is the ultimate operation, and I carry the sodium and potassium treatment to such an extreme that when I am removing the pulp from what I call a gouty tooth—one that is filled with pulp-nodules to a large extent, and it is frequently necessary for me to see a tooth of that kind two or three times—I leave the sodium and potassium inside the canals until the next sitting. I never think of using any hydrogen dioxid on the tooth until after I have used the sodium and potassium preparation for the last time. I trust that I have made myself clear on this point.

Dr. JAMES McMANUS, Hartford, Conn. It may seem singular, but it is a fact that I can recall only about half a dozen cases that I have treated. I will admit that I treated these empirically, without knowing very much about them, by cutting away the structure—not nearly so freely as Dr. Rhein speaks of—and by using alcohol and Labarraque's solution, packing the cavity with precipitated chalk, sealing this in the cavity, and leaving it for a few days, then removing it; and in a few cases I have had a certain amount of success.

Dr. G. L. HURD, Lakeville, Conn. We are told that there is a possibility of the discoloration returning. There was nothing intimated, I believe, as to the treatment in case this iron discoloration did return, and I would like to ask Dr. Kirk what we are to do in case this should occur.

Dr. KIRK. It is a fundamental principle in the consideration of the methods by which we treat these cases, that when we are dealing with hemoglobin stains or any stains that are caused by derivatives of hemoglobin, or any organic material, we may properly use the dioxid methods. When we have to deal with

metallic stain, which it practically amounts to when we reach the last stage of the discoloration, we must classify these stains with the inorganic or metallic stains. Now, as a general principle, I think our sheet-anchor in the treatment of the metallic stains is in some of the methods based upon chlorin. It is the same with those stains mentioned by Dr. Flanagan—and, by the way, I have been waiting for some one to sound a note of alarm at the use of base metals in the teeth. There is absolutely no excuse for it whatever, to my mind. As I say, our sheet-anchor in this class of stains is in the use of some of the methods based upon chlorin, because the chlorids of these metals are soluble, and can be washed out. They cannot be bleached by any of the dioxid methods, but can be by chlorin.

I am very glad that Dr. Flanagan mentioned the use of the base metals in teeth, as I want to say that I think such a practice is inexcusable. We should give our patients the best possible, and charge them accordingly for it. Don't save twenty-five cents on a pin and ruin your reputation just because the base-metal pin costs less. That is not good ethics, and after a while we will have a lot of this work to clean up all over dentistry.

Dr. Kirk's paper was then passed.

Dr. JAMES McMANUS presented to the society a photograph album which had been given by the society to Dr. Asa Hill at its first meeting in 1864. The album was returned to the society by Dr. Hill's daughter, Mrs. Iva Colc of Norwalk, Conn.

Dr. STRANG moved that the secretary be instructed to communicate with the daughter of Dr. Hill, expressing the

thanks of the association for the gift of the photograph album.

The motion was carried.

Dr. E. S. GAYLORD moved that the album be presented by the society to Dr. McManus, as he had been instrumental in recovering it.

Upon objection to this plan by Dr. McManus, Dr. A. C. Fones moved that Dr. McManus be made the custodian of the album.

The motion was carried.

Dr. McMANUS also called attention to a movement to erect a memorial to Dr. Horace H. Hayden at the place of his birth near Windsor, the soliciting of contributions being in the hands of Dr. G. O. McLean.

Dr. C. W. STRANG moved that a sub-

scription to the contribution for the purpose of erecting a memorial to mark the birthplace of Dr. Hayden be made by the society, and that the amount of the contribution be decided upon by the society.

The motion was carried.

Dr. CHARLES McMANUS moved that the amount of the contribution be twenty-five dollars.

Dr. CROSBY amended this to the effect that the amount be not less than twenty-five dollars nor more than fifty dollars, according to the condition of the treasury after the meeting.

The amendment was accepted, and the motion was carried.

Motion was then made and carried to adjourn until the evening session.

TUESDAY—Evening Session.

At the evening session the association listened to an address by Professor J. C. MONAGHAN, Washington, D. C., chief of the division of "Manufacturers," De-

partment of Commerce and Labor, on "The Duties of Professional Men in a Republic." Professor Monaghan's address was as follows:

THE DUTIES OF PROFESSIONAL MEN IN A REPUBLIC.

By Professor J. C. MONAGHAN, Washington, D. C.

PROFESSOR MONAGHAN began by pointing out the fact that a great German came here, studied our country, and went back to Germany with the word that it is a country of unlimited possibilities. The speaker preferred to call it as a land of unlimited opportunities.

Just now the world is worried over discontent. It is universal; it seems to be sweeping over the world. In Russia it is nihilism, or anarchy, because the government there against which it raises its head or arm is an autoeracy, called by some a despotism; the government of a man who according to Russian conceptions of government is responsible to nobody but God. Against this man and his government the discontented have organized into groups of nihilists and groups of anarchists. Even Tolstoi, the greatest writer, in my opinion, since Shakespeare or perhaps Goethe—the Victor Hugo of Russia—is a nihilist. He, even he, hates the government of his country.

As we pass southward over the borders of Russia into Germany we find socialism. Why? We find a finer form of government. Instead of an irresponsible

autocrat we come upon a ruler governed by a constitution, a man who is bound by law and his oath to act under and in accordance with the constitution; we have a limited monarchy. Discontent takes the form of socialism, it demands a co-operative state, the abolition of capital—or the present system—under which, it says, labor is exploited. Its growth is one of the wonderful things of modern Germany.

Across the Channel, in England, and across the ocean, in our own land, we have the labor question; that is the expression of English and American discontent. Now, in all lands, but particularly here, the dentist, with his wonderful opportunities, can do much. He should do all he can to let in light on these problems. He can talk with his patients; can keep literature on his tables, etc. Now, for a moment, let me ask you to look along the line at the great leaders of the world's discontent. The greatest of these were Germans.

Lasalle. Lasalle was a Hebrew, a wonderful boy, a wonderful man. He was called by Bismarck “das wunderkind,” the wonderful child. He converted Bis-

mark to state socialism, and led him to look upon state ownership of railroads as necessary for the success and safety of the empire. The empire and kingdoms of Germany now own nearly all the railroads, telegraphs, etc., in the empire. The post-office has a marvelous parcel-post system that takes the place of our express companies. The eloquence of Lasalle won the Catholic archbishop of Mayenne over to Christian socialism, and Dr. Stöcker, the court preacher of Berlin, a great Lutheran leader, to the same system. He is largely responsible for the fact that Wagner and many of the empire's great economists, professors in the great universities, are socialists—socialists of the chair or professional socialists. He was eloquent beyond words to describe; the most brilliant speaker the empire has ever had, a Cicero and Demosthenes in his way. For a time he lived in the borders of Baden, in the house of a friend; broke bread at his table, sat at his fireside, fondled his friend's children, laughed with them, chatted with them, sang to and with them. He ended by desecrating, degrading and destroying that home, debauching his friend's wife. Challenged to mortal combat he fell on the field of—dishonor, the bullet of the outraged husband entering his black heart.

Marx. The greatest force after Lasalle—if he is second to Lasalle—was Carl Marx, author of "Capital," a man of great powers, patience, perseverance, and persistence. Marx was a tyrant. He brooked no opposition. His word was law. He had a daughter, Eleanor, a woman of marvelous physical and intellectual beauty. This girl had Marx's gift of intellect; she had more than he ever had, a great gift of speech. She used to

talk socialism to the longshoremen, on the docks or in halls. Once, when she was speaking, a handsome man stood near the doorway listening. It was Dr. Aveling, a distinguished physician of London. He went day after day; they met, found that they were affinities, and married, after Aveling had divorced himself from his wife and had deserted his children. Then Aveling and Miss Marx, now Mrs. Aveling, came to the United States and lectured in all our leading cities, from Portland on the Atlantic to Portland on Puget Sound. Then they went back to London, he to his practice as a physician—for being an able man he had not lost it all—she to preach socialism.

One day in a London park a child reached out to Dr. Aveling, caught him by the hand, and began to caress him, crying, "Oh, papa! oh, papa, where have you been? Why don't you come home? Mamma and all of us are so lonesome. She cries, and cries, and cries. You will come back, won't you!" The man went all to pieces. The nobler nature within him was stirred to the very depths. He gave the servant, a maid of the children, a shilling, and begged her to come on the morrow. She came day after day, and he went to his little ones. One day at lunch he proposed to his wife Eleanor that as socialism had nothing in it to prevent it, he be allowed to bring his former wife and little ones to live with them. Her eyes flashed like a rattlesnake, her white teeth bit into her lips till the blood spurted; she got up, her face the color of ashes; he rose also and went out, and wandered in the woods or parks all afternoon. Toward the dinner hour, six o'clock, he came back, and asked for Mrs. Aveling. The servant

had not seen her since noon. Heavy with dread he crept up to her room and found her dead, stretched across her bed, an empty carbolic acid bottle on the dresser. Three weeks later they found his dead body on his bed—by suicide or heart disease nobody knows, but he was dead.

Come now to our own country. A brilliant speaker is addressing huge crowds in all parts of our land. He had been a teacher in the west, in Iowa, Nebraska, or Kansas. When he came east to Baltimore, Boston, Providence, or any of our large cities, no hall was ever large enough to hold the hundreds or thousands that flocked to hear him. On one occasion a woman and her daughter heard him, wanted to tell him how much they enjoyed listening to him, wanted to help him, etc. They went again and again. One day they invited him to go with them to Europe and Asia to see the world. They were rich, would pay all the bills, etc.. He went. In time he discovered that he and the daughter were affinities. They came back, he to discard, divorce himself from his wife, and to marry the affinity, Miss Rand. I refer of course to Dr. Herron. He divorced himself from his wife, the mother of his children. I know not what the agreed upon sum was—\$65,000 it is said; I do not care. I have been told, you will be told, that the wife didn't care; that since she had lost his love, she was satisfied, etc. Oh, the wretched sophistry of all these wretched tales! Of course the woman cared, but she was wise. Nature makes women wise. She had little ones. They must be cared for; since the husband and father was about to fail in his duty, the mother must take hold. That is charac-

teristic of mothers as a rule all over the world—God bless them!

Mrs. Herron looked to the care of her little ones, took the \$65,000, and Professor Herron went his way with his affinity. The old lady, Mrs. Rand, died, and has left \$250,000 for a school of socialism, and—save the mark!—Dr. Herron has become one of the high priests of the cult. He is trustee of the fund. God bless us!

A few days ago a man came to us out of Russia. The nation was about to open its arms to him. He was the martyr of a great cause, covered with the blood that was crying for justice. He was the apostle, not of peace, but of war against autocracy. I refer to Gorky, the great Russian, a writer who in some ways surpasses Tolstoi, the Zola of the Slavs. He lands; it is learned that the woman with him is not his wife. She is his socialistic wife, or worker with him in the cause. His real wife and little ones have been left behind in Russia. True to the policy and instincts of socialism, as soon as Gorky found an affinity, a soul like unto his soul, he discarded the woman who was his wife, who had borne him children. When all this was learned. New York—black, hideous, cosmopolitan New York—put up its hands and cast him off, repudiated him. I thanked God that day for the Puritan and the Cavalier—for the clean-blooded people who had come to us, and were willing to help us against an invasion of all that is infamous—an invasion that aims at the destruction of the home.

Gentlemen, members of the dental profession, Judge Brewer, a great judge, has said that a land is safe that has the school, the church, and a love of the flag.

No, you must have the home! Of course when you have the church and school and a love of the flag, you are likely to have the home; but I say, beware! look to it that the home is safe, is guarded. This is a work in which you can do won-

ders, for you are all educated men. You meet many.

After the address by Dr. Monaghan, the members and guests were entertained at a smoker.

WEDNESDAY—Morning Session.

The meeting was called to order by the president, Dr. Griffith, at 10 o'clock Wednesday morning.

The first order of business as an-

nounced by the President was the reading of a paper by Dr. J. E. NYMAN of Chicago, Ill., on "The Status of the Profession," as follows:

THE STATUS OF THE PROFESSION.

By J. E. NYMAN, D.D.S., Chicago, Ill.

IF an individual's own welfare is a matter of any concern to him, then too a matter of concern to him should and must be the status of his profession. It is a demonstrable fact that the first condition is largely governed by the second. Conversely, it is true that the second condition is in large degree determined by the individual.

It is said that "A nation is an aggregation of individuals, and that which is true of the individual is true of the nation." So too, "A profession is an aggregation of practitioners, and what is true of the practitioner will be true of his profession." Thus we have a reciprocal influence to consider affecting each one's mental, moral, and material welfare, which should arouse our most serious interest.

The status of our profession is a matter of public opinion, which latter will be but the composite opinion of each patient. The public is always ready to accord to any man, or any body of men, the esteem and the reward that they merit; there is no necessity of clamoring for it; indeed clamoring will only jeopardize the bestowal of that which is desired. We shall receive what we command, rather than what we demand.

The status of anything is of course a

comparative proposition. Our profession will be adjudged with that of medicine. If dentistry shall continue to be regarded as a profession wholly distinct from that of medicine, then it must not be expected that it will ever be regarded as equal to that of medicine or the law, for there is seldom the same gravity of possible results about it.

The public regard the physician as the one who stands between them and suffering, disability, deformity, and death, and they are bound to regard with great esteem and respect the one who protects them from such dire eventualities. They regard the lawyer as the one who stands between them and the loss of avocation, property, liberty, and even life; and they hold in high regard him who can deliver them from such a fate. They approach members of these professions filled with apprehension lest some of the calamities that they feel menace them shall actually befall them. Furthermore, there is so much uncertainty, there are so many mis-carriages of both medical prognosis and legal opinion, so many failures in the two professions just referred to, that he who is successful is regarded as little less than a savior.

Seldom, however, does one feel that any dental affliction involves permanent

deformity, disability, or death. The very fact that we have perfected the science of our profession to the point of almost absolute certainty of successful results in its practice, and the fact that of all the substitutes for the natural organs of the body, the most perfect are those for the dental organs, which almost invariably fully restore normal appearance, form, and function, have in a measure lessened public appreciation of our profession.

The certain success of dental operations has come to be regarded as a matter of course. That which is regarded as a matter of course is never given full appreciation. Paradoxical as it may seem, the perfection of our art and the certainty of our operations have in a measure depreciated the status of the profession by dispelling the fear of direful permanent results of disease and injury in the field of our practice.

Still there will be another estimate considered by the body politic in determining the status of our profession, quite apart from that established by comparison with that of medicine and the law, and that will be: the question of the necessity of our services to mankind, the benefits derived therefrom, and the evidence that our ability and our judgment are the result of a high-grade education, and of long application in the mastery of the theory and technique of our art.

Personal suffering from disease and accidental injury in large degree convince the public of their necessity of our services. The results of our labors are proof sufficient of the benefits we bestow. The evidence of a special grade of education and of long endeavor we ourselves will manifest or disprove in many ways, direct and indirect, consciously and involuntarily. What then are the factors

which operate to fix the status of our profession? They are of two classes—specific and general; those exercised by the individual practitioner (which are the more potent), and those exercised by the societies of the profession.

Specific factors will be the evidence on the part of the practitioner of ability, of resource, of honesty, of esteem for his profession, of education, and of culture. Yes, of culture; for that always suggests all these attributes blended with a fine dignity. The *Lancet* recently stated that even as it was a century ago, still is it true today, that "A certain fine dignity of appearance and action is the most potent factor of success in the career of a professional man."

Do not imagine that I mean that exaggeration of ponderous dignity which has been affected by the quack for so long that it has come to be regarded as the cloak of hypocrisy and incompetence. There is a poise based on ability, honesty, and refinement, that results in a certain dignity which is unmistakable, but which is not awesome and without affability. You know what I mean, and the people recognize it when they see it. Of two men of equal ability, the one with this fine dignity will be the one who receives the larger fees from the same class of people, whose services are the more sought after, and who has the least annoyance in the conduct of his practice. Indeed, both you and I can recall instances of a man of inferior ability who has held his own with a more able man, because he exhibited a certain fine dignity of appearance and action, while the other did not.

This dignity is synonymous with refinement and culture. How shall a man evidence it? In his sense of propriety, his value of proportion; in his dress—

even to the color of his scarf—in his cleanliness of person, in the furnishings of his office, the pictures on his walls, the books and magazines on his reception-room table; in his ability to converse about things classical, and to discuss logically and convincingly events and questions of the day.

It is the policy of wisdom to dress well, and to wear an air of prosperity before the public, even if one has to practice almost painful economy in private. Have you ever stopped to think of the suggestion of prosperity that goes with polished shoes, clean linen, and well-manicured finger-nails? The margins of our make-up are as critical points as are the margins of our fillings. The care of one's fingers and nails is as essential as the care of one's beard and hair. The furnishings and decoration of our offices convey a strong psychological suggestion to a patient. Avoid an exhibition of extravagance; a patient is quite apt to imagine that your fees are extravagant too. Better one good picture on each wall than four times as many mediocre ones. Better a simple photogravure of some fine painting than a real painting of inferior quality.

Do you feel yourself incompetent to direct this furnishing and decorating yourself? You will find it will pay to confer with some expert connected with an establishment devoted to this work, telling him frankly what you can afford to so invest.

For your private office I know of no better decoration for its walls than the photographs of your professional friends; they will be a source of comfort to you; a glance here and a glance there will bring to you pleasant and inspiring reminiscences, while to the patient they will convey the impression that you are a man

of wide acquaintance in your profession, hence a man of ability.

I know of nothing that better equips one to converse of things classical than the reading of books. Classical does not necessarily mean antique; classics in the fine arts—music, painting, sculpture, and literature—are being produced week after week in this present time. The classics furnish as entertaining reading as do the trash of literature, no matter whether your predilection be for stirring romance, humor, or profound philosophy. Do you feel yourself incapable of making selection? Then read the book reviews published in the daily papers and monthly magazines, instead of wasting your time on the details of the breaking of the automobile records: a glance at the headlines will suffice for the latter.

Go to the exhibitions of painting and sculpture that occur every little while. Attend every fine concert that you can. Attend the illustrated lectures of travel. Do these things, even though at present you do not find an attraction in them. You will at last acquire an appreciation; there will develop an attraction; you will add to your education.

To equip yourself to intelligently and convincingly discuss important events of the day or questions of policy that are the subject of great concern, read the editorials of the daily and weekly papers; take two papers of the opposite political creeds, and read both sides. Read the signed statements of special investigators and correspondents. Take for instance the prominent questions concerning the Panama Canal. I wonder how many of us have read Frederick Palmer's "Panama Without Prejudice" in *Collier's Weekly*, or Dr. Rowland's "The Truth about Panama" in *The Booklovers' Magazine*. Have you read "The Cry of

the Children," by Marie Van Vorst, and "The Looting of Alaska," by Rex Beach? They are articles that every citizen of the country should read. These instances might be multiplied many times.

Concerning ability, a man will involuntarily demonstrate the fact if he has it. As to honesty, he will practice it if he is wise, even if his conscience does not impel him to. No matter how tolerant a person is regarding honesty in the dealings of a man with a corporation, a legislative body, or a committee, he is insistent when it comes to personal dealings with himself, and is unforgiving if he finds it has not been accorded him. Furthermore, the dishonest man in a profession is usually classed as an incompetent man as well. The esteem the public have for us will in large measure be a reflection of the esteem which we evince for one another and for our work. As a fine old gentleman of our ranks has laconically put it: "We need not expect the public to respect us, if we do not respect one another."

Never yet did a man sweepingly criticize another, but what he weakened his hearer's confidence in himself.

Never jest about your profession, or complacently permit your profession, or yourself as a professional man, to be the subject of jest and joke. You may make silent but evident protest at the time such humor is attempted, by the expression of your face. Then seek immediate opportunity to privately inform the jester that your life-work is a most serious matter to you, and that you cannot consider as an appropriate subject for jest a calling which you have spent years of your life in fitting yourself to practice. Tell him you are quite willing personally, but not as a professional man, to be made the subject of jest if it be necessary to so

amuse the gathering, but that you do not desire your profession to be treated as a matter of amusement. If the person be a man of intelligence he will realize that what he did was thoughtless and inconsiderate; he will understand the motive of your protest, and both you and your profession will be exalted in his opinion.

If after such an admonition the same jester repeat the offense, then you are warranted in resenting it as a personal affront, and in administering to him a public rebuke, as stinging as your brain can formulate and your tongue utter. If you sit complacently by and join in the mirth following such a jest, can you not see that those present will conclude that there is little to esteem and value in either you or your profession, since you who are a member of it treat it as a matter of sport? You yourself will be regarded as too frivolous a man in whom to place any degree of confidence, since you laugh at your life-work; and let me remind you that in the confidence placed in you as a professional man lies your main chance of success.

Many of the public have still somewhere in the backs of their heads a reminiscence of the fact that once much of the dentistry was done by the barbers, and occasionally this comes to the front, and evidences itself in some such episode as this:

Jones of our profession meets Brown, of the law. They are introduced.

Brown. Glad to meet you, doctor. Yes—in general practice are you?

Jones. No, I'm practicing dentistry.

Brown. Oh, a dentist. (His tone plainly indicating that Jones has dropped in his estimation.)

Perhaps I may be permitted to give personal advice concerning such an episode. The next time such an inquiry

comes to you—as it will—reply that you are practicing a specialty of medicine. He will ask, “What specialty?” Answer, “That of dentistry,” and look him steadfastly in the eye. Your response will surprise him, and he will make some questioning comment on it. This will be a fine opportunity to enlighten him, and to impress upon him that your profession is very closely allied to that of the physician and surgeon, and is quite as scientific and beneficent. And in the mind of that person the status of our profession will have risen several degrees.

There are some things one should avoid because they are recognized insignia of a class we do not wish to be associated with. To still further eliminate the association of the dental office and the barber shop, I would suggest that we discontinue the operating jackets, which are manufactured with the intention to sell them to both dentist and barber. Long gowns of washable material are far more sanitary, and suggest rather the medical man than the barber. I do not mean gowns such as the surgeon wears at operations, but those made to fit something after the manner of a long-skirted military coat, which protects the trousers and gives a suggestion of surgical cleanliness. Already these coats are being worn by both physicians and dentists, and manufacturers will shortly have them on the market. The force of suggestion of cleanliness must be self-evident.

Exercise all the self-control at your command to avoid displays of sudden wrath, especially such as angry censure or abuse of a third party in the presence of a patient, no matter how exasperating the provocation may be. Such outbursts are indicative of a weak character, of an inability to master circumstances and control them. There is a vulgarity about

such affairs that lowers you in the estimation of any discriminating patient. Frequently there is injustice too—apparent to the patient perhaps at the time—which you yourself become aware of only when the period of passion is over; and to the suggestion of vulgarity has been added that of faulty judgment. Passion always constricts the field of vision, mental and physical, and circumstances that might mitigate the blame are usually unobserved. If you must censure severely, wait until there is no third party present. By that time you will probably be in full possession of your faculties, and mete out just what is deserved. Most of the historical mistakes of the world have been those made in an outburst of anger.

Perhaps all this may seem petty advice, but trifles sometimes sway important things in a sadly forcible manner. The suggestions conveyed by environment and manner are of the unconscious influences of life, and the enduring force of unconscious influences lies in the fact that they are subtle and sincere. Dignity and culture have a commercial value because of their mental influence, aside from the respect they procure. One with those attributes is free from petty impositions that worry and fatigue. Men do not impose on one they respect and esteem.

I have previously stated that I regard dentistry as a specialty of medicine. It is the most highly specialized specialty of medicine. How any unprejudiced thoughtful mind can otherwise conclude after careful study of this proposition is difficult to comprehend. Given the definition of medicine, as “the art and science of prevention and cure of disease, correction of deformity, and repair of injury in the human body” as a premise, how can any other conclusion be logically reached?

It is noticeable that most of the opinions to the contrary come from men controlling dental colleges, or occupying positions on boards of dental examiners, and it would seem as if their position were due to an apprehension that a conclusion that dentistry was a specialty of medicine would result in the abolishment of dental colleges and boards of dental examiners, rather than to logical deduction. Such apprehension is entirely misapprehension. Even if all the professions, the press, and the public did recognize such a relation between medicine and dentistry, there still would be the necessity for dental colleges and boards of examiners, and still would they continue to exist.

There is little danger that a physician would attempt to practice dentistry without having prepared himself to do so by special study and technical training, or that a dentist would attempt to practice general medicine without fitting himself to do so. The degree of M.D. permits a man to devote himself to the specialty of ophthalmology and otology, and yet few—very few—attempt such a thing without acquiring the special knowledge and mastering the special technique requisite to such a practice, and this is true of other specialties of medicine. Few men are so foolish as to attempt that which they know they are incompetent to perform. In this lies the safeguard of the people as much as in the laws.

To recognize such a relation would not more freely expose the public to imposition than now obtains. Legal restrictions cannot eradicate impositions. The impostor will prostitute any profession in which he is licensed to practice, be guilty of as much malpractice, and be as great a menace to the public in one profession as in another, and this in

spite of any law that can be framed and executed.

Fortunately impostors have methods of announcing themselves to the public that are so distinctively characteristic of the charlatan that only the indiscreetly credulous and the ignorant are ensnared, and to protect them they would have to be placed under restraint, which would be a violation of the liberties guaranteed by the constitution.

The trend of events shows clearly that such an affiliation of medicine and dentistry is being established by the slow but absolutely certain process of evolution, despite the scattered opposition of a certain number of individuals. More and more extensively and thoroughly are the fundamental branches of medicine being taught in the dental schools and more medical branches added to their curriculum. More attention is being devoted to dental pathology in the medical schools. Ultimately, perhaps, there will be but the one degree, although with the restriction of a special license to practice certain specialties of medicine—including, for instance, ophthalmology and otology as well as dental surgery.

Already has the medical profession recognized this relation by the establishment of the section of Stomatology in the American Medical Association, and the section of Dental Surgery in the British Medical Association. Our profession would do well to foster this spirit of closer association. It will enhance the status of our profession, and much mutual benefit to both professions result therefrom.

The dental profession would do well to proffer its moral and financial support to the medical profession in many of the projects for the welfare of the people that they are now endeavoring to establish by

education of the laity and by legislation. Gladly in return would the medical profession come to the moral and financial assistance of the dental profession in the promotion of similar measures. Think of what it would have meant to have had the aid of the medical profession as a body in the effort to establish dental surgeons in the army and navy—a provision of which there was great necessity and the motive for which was a desire to provide for a great need, and to increase the efficiency of both branches of the service, and not for the profit of the profession. The country has profited, for the efficiency of the army has been increased, while there is not a dentist in the army corps but who could earn a larger income and obtain more of the comforts of life in a private practice.

Of what great assistance would have been the co-operation of the medical profession in the endeavor of our profession to secure the adoption of adequate state laws to regulate the practice of our specialty?

The suggestion that members of our profession should join the Stomatological Section of the American Medical Association is worthy of great consideration, and should be accepted. It would not only be beneficial, but would show the proper appreciation of the manifested attitude of the medical profession toward us. It would do much to place us where we ought to be in the courts of the land, that is, on a par with the physician, the lawyer, and the clergyman, in exemption from jury duty. Every argument for special privilege in the case of these three professions applies with equal force and cogency to our calling, and it is time that a serious systematic effort was made to reverse the obsolete and illogical rulings of the judiciary in this matter. Think

of what the support of the medical profession would mean in such an endeavor, and how easily it could be accomplished if our calling were accepted as a specialty of medicine.

Man never accomplished anything until he began to associate and co-operate with his fellow man, and then the possibilities of life came to be apparent, and by concerted effort were transmuted into the tangible utilities and comforts of life. The value of association and co-operation is as great as ever it was, and as productive of benefit to both individual and society.

The power of state societies could be greatly increased by the institution of local societies and their close affiliation with the state society, as has been done in the state of Illinois, where the state society has increased its membership four hundred per cent. It has fifteen hundred members, comprising fifty per cent. of the profession in Illinois, and has become a body of such importance that its opinion is of great weight with both the legislative and executive branches of the commonwealth. This same suggestion applies to the National Dental Association, an institution that should be to our profession what the American Medical Association is to that of medicine.

Have you ever stopped to consider the attitude of the public press toward us, and the impression thus made as to public regard? Their news items concerning our meetings are a matter of jest, accompanied often by ridiculous cartoons, inspiring a similar feeling on the part of the laity. How their mention of our meetings differs from those of medical meetings! My attention was especially directed to this matter recently by a journalist, who inquired why our dental societies had never corrected this matter

by appointing a press committee to confer with the managing editors of the prominent papers, and arrange for a dignified, accurate, and intelligent report of our meetings. He assured me that the managing editors of the influential papers were intelligent, considerate gentlemen, who would appreciate and accede to such requests if properly presented. Why should this not be done?

Men of the most convincing power of manner and speech should constitute these committees, for it is really a matter of much importance.

Would it not serve to elevate the status of our profession if at the annual meeting of each state society every paper of importance in that state published such a report as has been suggested, and if at the annual meeting of the National Dental Association every paper of importance in the country did likewise?

Why has not the fact that the national medical associations of America and England have—by the creation of dental sections in connection with their associations—recognized our status as equivalent to theirs, and our calling as a specialty of medicine, been promulgated to the people through the medium of the public press? Think of what an uplift that would be for our profession in the estimation of the laity.

The establishment of an official journal of the National Dental Association, published by the association, modeled after the *Journal of the American Medical Association*, would add to our standing with the medical profession. There is a perfect surfeit of dental journals these days. We are being stuffed with them beyond our ability to digest and assimilate. Every supply house that has capital to do so is publishing a dental journal, and the publishing department

is now regarded by these concerns as a purely commercial factor, as essential as the sales, bookkeeping, and shipping departments, and as a result, the character and influence of our current literature has depreciated. The editors of the journal should be the priests of the profession, and by impartial publicity and unprejudiced advice should right wrongs, correct errors, and lead the profession on to better things. Great injustice has on occasion been done by elaborating one side of an honest controversy and withholding all mention of the other.

The weekly publication of a journal such as has been suggested, edited by capable men of our profession who should be paid salaries for their services, would be of great benefit to dentistry.

The recent action of the National Association of Dental Faculties in fixing a full high-school course or its equivalent as a standard of preliminary education essential for matriculation, will have a marked influence in uplifting the status. Professional colleges should be a part of and under the control of some recognized university, and those that are stock corporations, wherein the stock is owned by one man or a few men, should not be countenanced or recognized. Professional colleges have multiplied beyond any necessity for them, and it cannot be denied that—in many instances—they were instituted for financial gain or from a motive of retaliation; and in the effort to secure students and develop infirmary clinics, subterfuge and deception have been known to be practiced. Much of the hostility between colleges, and between the colleges and the state boards, has thus been engendered. It would seem that it must be possible for the National Association of Dental Faculties and the National Association of Dental

Examiners to meet on some common ground, and work in harmony with one another for the good of all. Personalities should be subordinated to the common good. Those who take an antagonistic stand, based on personal animosity and without regard to the principle involved, should be simply squelched. Both associations are so strong and widely representative that neither can dominate and dictate to the other. Why not recognize this, and meet one another half-way, fairly and frankly, and, having an amicable, honorable compromise, both associations work in unison for the common good?

I would have every graduate in dentistry go forth from his college thoroughly impressed with the important influence the status of his profession has on his welfare, and with the realization of how important a factor the individual is in determining that status.

Every college should provide for a course of lectures on ethics and the conduct of a practice, to be delivered to the

seniors in the last term of their course. Not the usual dry, moralizing, perfunctory addresses; the cleverest, brightest, most convincing lecturer that could be procured should be the man for the work. His lectures should be a source of entertainment as well as of instruction. Of course, to begin with, the students would have to be forced to attend them, but if the proper man were chosen and the lectures were what they should be, they would become a tradition handed down from one class to another, and the classrooms would be crowded, the lectures looked forward to, and the graduates go forth with a fuller sense of their responsibility in advancing the status of their calling.

Our profession is an honorable one. It has a scientific basis. It is a factor for the welfare of mankind. Among its number are poets, artists, sculptors, authors, orators, inventors, and scientists—men who rank with the notable ones of any of the other professions. Its status should be the concern of all.

DISCUSSION.

Dr. T. J. BARRETT, Worcester, Mass. I submit for your consideration, Mr. President and gentleman, that the brilliant and able paper which you have heard this morning does not need any discussion. There is not anything in it for me to discuss. I am in such entire accord with all that has been said that I feel the best thing I can say would be to suggest that the essayist re-read the paper, so that it might be impressed the

more fixedly upon your minds. There is little in the paper that I can take exception to, as it contains most wholesome advice for us all. It presents the status of our profession, the duties of the individual dentist to his profession, and the duties of dentists to one another in such a clear and concise way that it contains lessons for us to take home and remember, and when it is printed it will be well for all of us to re-read it occasionally.

I had hoped that I should have an opportunity to go over the paper before it was read in order to see if there was anything in it that I could take exception to, but I did not have that privilege, so as the essayist read his paper I jotted down one or two notes on points that occurred to me as calling, perhaps, for some comment.

Dr. Nyman presented a new idea to me when he said that dentistry was so essentially a specialty of medicine that the schools of dentistry and the state boards were somewhat in danger of absorption by the medical profession. I never thought of dentistry in that light before. Dentistry is so different as a specialty from medicine that it never could be taught as the latter is. It is so dissociated from it and yet so closely associated with it, that it will always be necessary to have separate colleges in which to teach it, and separate boards to judge of the fitness of the candidates to practice it. On the theoretical side we are closely associated with medicine, while on the practical side our profession is so foreign to medicine, that I do not believe the time will ever come when the medical profession will undertake to absorb dentistry.

The essayist's contention with regard to stock colleges is an old theme of mine, as it is a subject on which I have talked many times. I believe the time is coming—and it is the duty of the profession to hasten the day—when stock colleges run for private gain shall be blacklisted, and then young men entering the study of dentistry will be warned against them. And I think that is a time dentists may look forward to with much pleasure, especially those who are interested in the upbuilding and uplifting of the profession. We cannot be encouraged to de-

vote our time and efforts to the elevating of our profession while some of those who are entering it today are invited into its folds by a low class of colleges which are run for private gain. This has grown to be such an evil that the Faculties Association has at last recognized it, and has adopted a rule which requires a high-school course for matriculation in all the colleges. This will be lived up to by some of the colleges, while in others many students who have not this required education will be admitted under some subterfuge. That has been the history of the past, but it may not be so in the future.

As to the position of the essayist with regard to the National Association of Dental Faculties and the National Association of Dental Examiners, I believe with him that strenuous action on the part of one toward the other is bad.. It would be better for them to work in harmony and co-operate one with the other. In my experience with examining boards I have sometimes suspected that they are examining the students from a higher standpoint than the colleges were educating them to. Examining boards as I know them examine students as to whether they are safe men to admit to the practice of dentistry, and it seems to me that in examining students the boards should expect from them only what should be expected by the colleges from the students when they are graduated, viz, that they are safe men to allow in the field of practice. The colleges have no right to graduate students who in the judgment of honest teachers are unfit to practice dentistry with safety to the public. And I submit to you, gentlemen, that they do pass such men out into the world to practice dentistry. I will say that in times past nearly fifty per cent.

of the entire college output were unfit to practice when they passed from the hands of the colleges. Now, this is a sad condition in dentistry, and the good teachings of men like the essayist, engaged in the uplifting and upbuilding of our profession, are being offset thereby. You cannot elevate and uplift the profession so long as that condition exists. You cannot inspire the public with confidence while men who are unsafe and unfit to practice are being graduated and granted degrees to do so by the so-called dental colleges. I believe that that is the root and branch of the evil, and until that is eradicated I do not see immediate prospects of any great improvement in the general conditions of dentistry. I am not ready to agree with Dr. Nyman that only the output of the universities should be recognized; but I do agree with him that we should eliminate the stock colleges that are run for private gain.

I have submitted this proposition before, that is, I do not believe any dental college should exist for private gain and for the financial benefit of any set of individuals. I believe most teachers of dentistry today are underpaid, and further that the man who devotes his time to a college for teaching dentistry should be well paid; that the colleges should employ only able, conscientious teachers, and that these should undergo some special training for such responsible positions. They should be well paid, and after that has been done and the necessary running expenses of the colleges paid, my idea is that any earnings beyond that point should be reinvested in the development of the colleges for higher education, and should not be a matter of private gain for the individual, or set of individuals, who conceived the idea of building and operating the college.

I do not wish to be considered as taking an unfair stand or an unfair advantage in regard to stock colleges, but I believe the day for their existence is passing. We do not need in this country sixty dental colleges, as the people are not suffering for dentistry. There is a demand for good dentists—for better dentists than we have now, and for dentists who will strive to build the profession up to the point where Dr. Nyman describes and desires it. Then we would not fall in the estimation of any man when we were known to be dentists. The reason for this is that there are so many inferior men in the profession—so many “fakirs” in it. And I ask, how can we get rid of them when we have “fake” professional men running “fake” institutions? Why, gentlemen, it is the most natural thing in the world that their products should be fakirs. Some students go into the colleges and see the infirmaries receiving great incomes for inferior work, and they say to themselves, “Let us go and do likewise; we can do it on a small scale, and we will do it for what there is in it. We are engaged in dentistry to make money; never mind the fellows who attend society meetings and call themselves ethical. Perhaps they may be a little more cultured than we are, but we are in this business for the money there is in it.”

Dr. Nyman's reference to the trade journals and supply houses is timely. I think these are impositions upon the profession. We do not find other professions overburdened with supply houses bearing down upon them and combining to take all they can from them. It is true that they do not require so many tools and instruments as we do, but what they require they can go into the open mar-

ket and buy, and I wish we could do the same. The medical profession is not obliged to support the supply houses that we have; no trusts, no combinations to keep in condition to pay fat dividends. Our supply houses undertake to establish and justify their combine with the efforts and influence of their journals, and we are overstocked as a profession with their ideas. I think the time has come for the profession to take a determined stand in this direction and shake some of them off.

In closing I want to say that I enjoyed the paper very much, and I am sure that it will be well worth reading by every member of our profession when it is published.

Dr. JAMES McMANUS, Hartford. I do not know when I have listened to a paper treating of the status of the dental profession in which I have been as much interested as I have in the one we have just heard. I have no fault to find with the colleges generally, and do not make any sweeping statement or assertions against them. Where would dentistry have been today were it not for the first college, the good old Baltimore College of Dental Surgery, which was a stock college? The establishment of dental colleges was entirely without the aid of the medical colleges or universities, but when they saw that there were from four hundred to one thousand students in the dental colleges, with the prospect of a yearly increase in numbers, the medical colleges and universities began to think that they had better gather them in, and the medical men began to respect the men who were the creators of these stock colleges—as my friend Dr. Barrett calls them. Some of these colleges may be—and I have not the slightest doubt that some of them are—run

on different methods from what they should be, but in the past they have done much good, and they are forcing the medical colleges and the universities to a higher standard.

There is nothing that my friend Dr. Nyman said but what I can indorse and enjoyed hearing, but when you think of the dental profession as a profession—that it is supposed to date from about 1839 or 1840 when the Baltimore College of Dental Surgery was established; when you think that there have been medical schools all over the world for ages; when you think of the short life of dentistry as a profession, and take the graduates from these different colleges and place them side by side with the graduates of the medical colleges, I claim that the dental student leaving the dental colleges today, even the poorest of these colleges, will stand on a par with the graduates from the medical colleges. I do not believe that the graduates from the medical colleges, taken throughout the country, are better fitted to treat disease than the dentist is to perform dental operations. When the young man comes out of a medical college, he has almost entirely a theoretical education, and knows very little of the practical side of treating disease except what he sees in the hospitals; but the dental student has the opportunity of observing a great many operations and the opportunity to perform them, and although many students may not have the ability to pass the examining boards, they are capable of doing the ordinary work of dentistry. There may be other reasons besides actual ignorance which prevent their passing the examinations of the boards, and I think many of the men who have gone before examining boards and have failed to measure up to the standards of these

boards are competent to do the ordinary work of the ordinary dentist.

The status of our profession is, or rather should be, the status of its leading members, and when you look back and think of the men of the years past who are known the world over as dentists and also as scientists, and known as men of culture and literary education, I think the dental profession has much to be proud of. I would like very much to see the standard higher than it is today, but considering the age of the profession, I think dentistry stands very well before the world. We have, and will have in the future, plenty of opportunities for up-building and uplifting ourselves as a profession, and I think we are gradually doing it. If hereafter it will be difficult to enter the profession of dentistry without first going through a university, then dental education will naturally produce better educated dentists than those of the past; but unfortunately, as the result shows for the last ten or twelve years, a large number of the young dentists from these colleges who go out into dentistry have not as a rule been interested in the dental societies. In the past fifteen or twenty years the National Dental Association has not increased in membership very much. Today I do not believe its membership numbers five hundred, and there are thirty-two thousand graduate dentists in this country. For a number of years these graduates, as a general rule, have not been coming into the state societies and pushing ahead to gain membership in the National Dental Association. There is something wrong somewhere. Whether it is in the college education, or whether it is in the influence of the older dentists over the young men; whether the older dentists have not encouraged the young men properly, or

whether they have not been invited by the older men to join the societies; no matter what the cause is, they have not come in. Take this state, with five hundred or more dentists, and see our membership. We all know the great advantages and benefits that have been derived from our society, and we know that it has created a better feeling, a more harmonious feeling among the dentists of the state; we know that it is improving very much, but we also know that there is room for considerably more improvement.

There was one feature in the essayist's paper which impressed me very much and to which I would call your attention—the matter of a press committee. A few years ago we had a press committee in the society, but it has been dropped, and in recent years there has not been as much interest taken in that feature of our meetings as there should be. I think there should be such a committee, composed of the best and liveliest young men in the society. I read the Bridgeport papers here last evening and this morning with much interest and pleasure. It was pleasant to see that their reports and headlines were different from what they were a few years ago. It was not that the "Tooth-pullers are Holding a Convention in the City," which has been one of their stock headlines. The reports, too, in the papers have been good, one morning paper giving quite an acceptable account of the lecture last night. This will have its good influence on the people of this city and state—and what we need is to have our affairs more generally brought to the attention of the public. We also need to conduct our meetings in such a way as will enlist the interest of the press sufficiently to insure the publication of such reports as we should have.

Again, as I said, the status of the pro-

fession depends entirely on the individual character, culture, and ability of its members.

Dr. W. D. TRACY, New York, N. Y. The essayist speaks of the relative positions of the medical and dental professions in the estimation of the public. Of course, taking the position of importance that the medical man enjoys, dealing with life and death as he does, it is natural that the public at large should look upon the physician as their dearest friend in time of need, and I myself think that the conscientious, honest practitioner of medicine, conducting a full practice to the best of his ability, occupies one of the most exalted positions that a man could occupy; and along this line, of course, the dentist is limited in the scope of his work.

I admire Dr. Nyman's optimistic trend of thought, but I do not think that I am ready to go among my friends and say that I am a specialist in medicine. I am not; I am a dentist. I never had a medical degree; I only wish I had, but I do not think I am a specialist in medicine. The utopian idea of the dentist being a medical specialist is something I look forward to, and I hope that we may live to see many men in our profession holding the M.D. degree. Those who hold this degree and practice dentistry are practicing a specialty of medicine; I am not. Furthermore, I do not believe in the surgeon's frock, and I do not believe in the white enameled office, and a lot of unnecessary fixtures to frighten patients, causing them to think they are in the surgical ward of a hospital. I want my office to be a place for the convenience and comfort of my patients, and so long as I remain in the practice of dentistry, that is the way it will be arranged.

The essayist speaks of the past history

of the profession: I believe we should think and speak reverently of our early history, because we owe so much to the past. We are standing on the firm foundation laid by our forefathers. By their suffering and hard work, by their study and earnest efforts, they have established dentistry on the firm foundation upon which it now stands. We are, however, making rapid strides in our development, and will probably continue to do so indefinitely. Dentistry is yet in its "swaddling-clothes" as compared with medicine. Our development has been so rapid that the day is not far distant when we will be more important in the eyes of the public and of medical men. Physicians are beginning to realize now that they can do their work better with our aid than they can without it. Dr. Nyman also told you that he was neither a preacher nor a prophet. Now, I claim that he is both. He has preached the best preachment today that I have heard in a long time, and he has prophesied some things for the future that we will all see come true. He also speaks of the commercial value of dignity and culture. Those of us who know Dr. Nyman know that he does not mean that literally, so I will not take up that phase of the question. Dentists have occasionally, however, put on the sham cloak of culture and dignity, because they knew it would help them with their work among a certain class of patients; but dignity and culture should be gained for your own satisfaction and not because of their commercial value, and also for the sake of the joy that comes from living your life in an atmosphere of refinement and culture.

Speaking of the evolution of dentistry, and also of devoting time and money to research, interests me to the point of ask-

ing the president to allow Dr. Kirk to tell us of the Carnegie Institute, and what effort it is making to have our profession co-operate with the medical profession in following out different lines of dental research.

Dr. H. W. GILLET, New York, N. Y. We hear so much tommyrot about the status of our profession, and so much that is of little value that I appreciate very much this paper by Dr. Nyman, and believe that it is a classic. When one-third of our profession are cultured gentlemen and loyal to their profession, doing their share of the charity work of the world—their share as compared with the other branches of arts and sciences—we shall secure all the recognition we want. I like Dr. Nyman's characterization as I heard it in one of the first sentences of his paper, but I would change one word in it. He said we will get the recognition from the community that we demand, but I would say, we will get not what we demand, but what we earn. Labor unions receive recognition because they demand it, but we cannot get it that way.

I want to amplify one or two points brought out in the paper:

First, loyalty to our profession. When in public stand by your profession and your professional brother, and when you go into society work, if he is going wrong, be loyal enough to show him where he is at fault. I think much of my friends in the profession, but I love and respect my profession more than I do any man in it. When I see my brother member going astray, I try to push him over the other way a little; and I want him to reciprocate in kind.

Second, charitable work. I want to mention one point in this connection. At a banquet which I attended recently I sat beside a gentleman connected with the

New York City Hospital, and he asked me how much I thought the medical profession in greater New York was doing annually in charitable work, estimated at tenement fees—that is fees not to exceed one dollar per visit. I had not the least idea, and I do not think any of you would guess it correctly, but his answer was sixteen millions of dollars annually. Dr. Nyman conveys the idea that we have attained pretty nearly perfection in our field. Well, gentlemen, the developments of the last six months are beginning to make me feel that I knew little about dentistry a year ago, and I expect the developments of the next six months are going to make those of the last look small. We are only just beginning to realize the importance of our work and our duty to the public. How many of the diseases that the medical profession are handling today are dependent upon nutrition?—indeed, in how many of them is malnutrition the sole cause? We are standing guard over the beginning of the nutritional process. Our function is, first, to prepare the apparatus which will start digestion properly, and secondly, we have a function to perform which we have not been exercising properly. We should teach our clients to start digestion properly; how to rightly prepare the food before it enters the digestive apparatus, so that it will be in a fit condition to furnish nutrition, and not in a state that will lead to decomposition. When we consider the possibilities of our work in connection with Bright's disease, diabetes, and various gouty conditions, we realize the importance of our sphere.

I am sorry certain men are not present today, because I wanted to talk more personally and pointedly than it would be fair to talk in their absence, and conse-

quently in their inability to make reply. There is one feature of our ethical obligations that is neglected frequently by prominent members of our profession. Just so long as the men whom we place in exalted official positions—men to whom we do honor—become officers in the various gold-brick concerns with which we are afflicted, concerns which are simply adopting this course to work off on us shares of stock in some concern that is going to supply us with our own materials, or worse still, is going to supply our patients with certain materials, and only want to enlist our aid in doing so; just so long as we allow men whom we place in these conditions to do this, just so long shall we be the butt of the other professions.

The question of the colleges has been taken up thoroughly. The colleges we are “gunning for” are the colleges conducted for revenue only. There seems to me but one hope for our colleges, and that is in the development of the university spirit. By this I mean that spirit which makes every man on the faculty of a college or the board of instruction give his time and energy to this work, at a return which he could easily double if he stayed in his own office, which means the making of sacrifices in order to educate the men who are coming into the profession.

I do not like the term “specialty in medicine.” One reason why I dislike it is that I have been brought into contact with these men to a considerable extent, and as a rule, when I see a man who has both degrees, he is ashamed of his dental degree. He is practicing a specialty of medicine, and does not want to be known as a dentist. Now, gentlemen, I am proud to be a dentist, and I am ready to stay a dentist as long as I live, and I

want to work to make the profession one that we will all be proud to be members of. We have work to do along the lines we have had pointed out to us today by Dr. Nyman.

Dr. NYMAN (closing the discussion). It is evident from the discussion that at times in the presentation of my paper I read so rapidly as to be misunderstood. I did not say as Dr. Barrett thought I did, that dentistry was so essentially a specialty of medicine that the schools of dentistry and the state dental boards were somewhat in danger of absorption by the medical profession. What I said was diametrically different; for I said that such apprehension was misapprehension, and that even if dentistry came to be commonly regarded and classed as a specialty of medicine, still there would be the necessity for dental colleges and boards of dental examiners, and still would they continue to exist.

Nor it seems did I make myself clear to Dr. Gillett, for he quoted me as saying “We shall receive the recognition we demand,” etc.; whereas the paper reads “We shall receive the recognition we command rather than what we demand.” I was very much interested in his statement concerning the value of the charitable work of the medical profession. I have always felt that it far exceeded that of all the other professions, and put the seal of high nobility upon the profession.

I know of two men of our profession in the city of New York—one of them I see before me now, but I shall not mention his name because I believe he would rather I did not proclaim his philanthropy—who equipped a room in one of the New York medical infirmaries, and who devote a certain number of hours each week to charitable dental services.

It would be well if more of us did likewise.

It is to be deplored, as Dr. Gillett has said, that men of standing in our profession will lend the aid of their names in the commercial exploitation of our profession, for the sake of a few dollars' revenue from a limited amount of stock. It is an exhibition of the mercenary commercial spirit instead of the professional spirit.

I do not condemn all stock colleges, but I say they should be abolished, because of the opportunities they present of imposing both upon public and profession from motives of pecuniary gain. I grant that in the past they may have been the only means of instituting our professional schools, but at the same time I contend that conditions have so changed that they are no longer a necessity, but are something of a menace. I quite agree with Dr. McManus that many state-board examinations have been manifestly unjust and over-difficult, and at the same time have been of very little value in determining a candidate's fitness to practice dentistry in the commonwealth; but on the other hand it cannot be denied that many college courses are woefully lax and inefficient. I cannot agree with Dr. Tracy that a man's titles make any difference in the nature of the practice in which he is engaged; if a man with the title M.D. in the practice of dentistry is practicing a specialty of medicine, so, too, are all the other practitioners of den-

tistry, whether they hold the degree of M.D. or not. I know a man in the practice of dentistry who holds the title LL.D. as well as D.D.S. and yet one could not logically contend that that man was practicing a specialty of law because of his title LL.D.

I think we are destined to see our operating rooms alter vastly in appearance from what they used to be; the necessity for sanitary equipment and environment is self-evident, and will soon be generally demanded by the public.

I trust no one is under the impression that I am in any way ashamed of our profession, for on the contrary I am proud of it. It is fully as honorable as beneficent; as scientific as any of the professions; but I do not think we have reached the status we should occupy.

I deeply appreciate the kindly personal remarks of the gentlemen who have taken part in the discussion. They are among those who make our profession one worth while in which to labor.

I feel that I have been honored by the invitation to appear before this society, and for the many hospitalities and courtesies of which I have been the recipient I thank you.

Dr. Nyman's paper was then passed, and the President announced as the next order of business the reading of a paper by Dr. V. H. JACKSON, New York, N. Y., on "Orthodontia," of which a synopsis here follows:

A PRACTICAL TALK ON ORTHODONTIA.

By V. H. JACKSON, M.D., D.D.S., New York, N. Y.

DR. JACKSON opened the talk by describing how he regulated teeth in 1880, drawing teeth outward by ligatures to a labio-buccal bar; also describing how he regulated teeth by the use of collars, jack-screws, split plates after the Coffin method, etc.

He asked dentists who had been in practice twenty-five years or more what methods they employed for regulating teeth at that time.

He described the "crib" appliances which he introduced and used for several years, but not being satisfied with the anchorage of the crib appliances, he devised his present improved system of removable appliances.

The appliance consists of partial clasps, spring clasps, base-wire, finger springs, lugs, etc., assembled on an accurate plaster model, on which they are soldered. Spring-clasp attachments retain the appliances in position by grasping the anchorage teeth. They are made by first arranging partial clasps on the lingual sides of the molars and bicuspsids that are to be used for anchorage. The partial clasps are made of pieces of 18-k. gold plate, No. 36 standard wire gage, contoured to fit the side of the tooth, usually the lingual side. The gold is roughened on the side on which the solder is to be applied.

The spring clasps are of No. 21 or 20 wire, either of gold, silver-nickel, platinum, or German silver. They are shaped to fit the opposite side of the tooth from the partial clasps near the gum, with the ends passing over the arch, following closely at the junction of the teeth, and resting on the partial clasps, to which they are finally soldered. A large wire known as the base-wire or body of the appliance is shaped to cross the arch, following the palatal curve, with the ends bent forward or backward at nearly a right angle, forming arms which rest on the partial clasps, to which they are finally soldered, with the spring clasps. To this anchorage portion of the appliance springs of any form are soldered. They are shaped to extend like fingers for moving any of the teeth in the arch as desired. The base-wire crossing the palatal arch is termed a palatal base-wire; when it follows the lingual curve of the teeth, a lingual base-wire; and a labio-buccal base-wire when it is arranged to pass on the labial and buccal sides of the teeth. Each form of base-wire has its special advantages.

Expansion of the arch is required in a large majority of cases. When the anterior part of the upper arch needs lateral expansion, a palatal base-wire is arranged to cross the distal part of the

arch where it is broad enough, with the ends bent forward, forming arms. The arms are soldered to the partial clasps with the ends of the spring clasps forming the anchorage part of the appliance. The solder is usually of chemically pure tin flowed with the soldering iron.

The appliance is fitted and worn about three days before force is applied; then, before putting on force by bending, the appliance is laid on a thick piece of paper, a tracing made of it with a sharp pencil, and the tracing kept as a permanent record. A dot mark is made about one-sixteenth of an inch outside of the tracing to indicate the distance the arms or anchorage portion of the appliance is to

be bent outward. The bending is made to correspond with the new marking by taking one of the arms of the appliance in the thumb and finger of each hand, and pulling outward sufficiently to bend the base-wire a little, causing the appliance to conform to the new marking on the chart. This reduces orthodontia to a true science, as the distance it is desired to move the teeth by each application of force is determined and known beforehand, and a record of the change, with the date, noted by means of the chart.

Additional force is applied about once a week, each change being indicated by an additional dot mark on the original chart.

DISCUSSION.

DR. GEORGE T. BAKER, Boston, Mass. I do not think that I can discuss Dr. Jackson's paper, but I can corroborate what he has said. The testimony of a witness in court is sometimes strengthened when it is corroborated. Now, if I can say anything which will induce you to follow his teachings, I will willingly do so. He has been a great help to me, and I believe that in this work we can accomplish results with Dr. Jackson's system very much more rapidly and easily than with any other system in a great many cases. I am not wedded to any one particular treatment in operative or prosthetic dentistry, but have always held that different cases require different treatment, and I believe this same rule holds true in orthodontia. There are cases when perhaps one system is more applicable than another, and there are

very many cases in which Dr. Jackson's system is the best. That has been my experience.

I heard it said in Buffalo last summer, in discussion before the National Dental Association meeting, that there was no such thing as a Jackson system. Now, I thoroughly believe there is a Jackson system. Dr. Jackson has worked out this method—which it has taken him years to do—and when he stands on the platform and explains a thing to us which is apparently very simple, we do not perhaps realize that it is the result of many failures and years of experience on his part; but it is true. Today, in the East, there are but two systems of orthodontia in general use. There is the Angle system—so called—and there is the Jackson system. The Angle system means the use of the expansion arch and clamp

bands attached to the teeth by means of screws and nuts. The expansion arch gets its power from the nuts resting in front of the tubes of the clamp bands, as well as from the spring in the arch wire itself, and the power is carried to the teeth by means of wire ligatures. In the Jackson system the ligature is done away with altogether, as it is never used, but the force is obtained wholly by the spring of the metal in direct contact with the tooth, and the spring force is the simplest we can apply to the teeth. It is direct and positive, very efficient and completely under control; and that is a great thing in its favor. Dr. Jackson has not only given us a thorough exposition of the mechanical features, but in his work he has given us an excellent classification of the etiology of all these cases, and really that is the principal thing. The mechanical feature is nothing in comparison with the etiology, for if we really know what causes an irregularity, we are in a fair way to correct it. We may take a case in point in medicine; for instance, in tuberculosis, the cause has only been recently understood, and tuberculosis is now looked upon as a disease of malnutrition, and it is often cured by attention to hygiene and dietetics solely, and without the exhibition of drugs. The minute we get at the real cause of any trouble, we can remedy it, and if we study the etiology of irregularities, then we are in position to practice orthodontia successfully. Dr. Jackson has given us an excellent exposition of this feature of the subject, and it is going to be understood more and more all the time, as is beautifully shown in his treatment of the cases exhibited in the charts.

Just one other point, and that is in starting out in this work. The best

way to begin is to try a simple case. If we start with a complicated case we will have a failure, and failures are very discouraging, and may cause one to give up this work altogether. If, however, we start on a simple case—for instance a case of an inlocked incisor, which is one of the simplest operations—we will probably succeed, and then we may feel like attempting a more complicated case. And so if we start gradually with Dr. Jackson's system, I believe we will have success.

DR. ROLOF B. STANLEY, New York. I feel in discussing the merits and demerits of orthodontia appliances that differences of opinion with regard to their value are based upon our conception of what the ultimate result should be. The ultimate result covers the whole field of orthodontia, and so a discussion of what is shown here would be entirely out of the question. There are just a few things that I would like to speak of, however.

From the diagrams I would feel almost inclined to adopt Dr. Jackson's method of correcting malocclusion, were it not for the fact that I am called upon to treat the cases which come to me for greater complications than his diagrams show. In a large majority of the cases that I have treated, expansion of the arch was called for. Furthermore, I find that the bicuspids, laterals, and centrals nearly always need rotation, and the work must be carried on together with the expansion of the arch. Dr. Jackson said that the arches are usually broad enough in the region of the molars. I do not find such to be the case; in fact there are very few cases which do not require expansion in the molar region.

When he speaks of the cases characteristic of mouth-breathing, or the reverse

condition, lower prognathism, in every instance expansion of the molar region is necessary, not only in one arch, but nearly always in both.

Now with regard to the age of the patients: I think Dr. Jackson is entirely right in commencing as soon as any trouble is in evidence. I have many patients with the same trouble that Dr. Jackson referred to, who are very young.

As to the frequency of appointments, I see my patients two or three times a week. I prefer to do that, as I would be afraid to allow them to go three or four weeks. I do not think that it is the fault of the appliance I am using, but simply because I want to follow the changes all the way through. I want to know that all the teeth are moving on the exact line that I have outlined for them.

Allusion was made to the application of wire ligatures as seen in a clinic at one of our universities, in which the patient underwent terrible torture. I think many of these patients probably would have undergone torture in any operation undertaken in the dental clinic under such conditions. Now, I think I can apply the ligatures in such a manner that they will not make the patient squirm out of the chair. I put them on patients of all ages, and try to insert them painlessly, and think I succeed. I do not find them going into fits or trying to squirm out of the chair. It is the same with this operation as with any other, there are two ways of doing it.

With reference to the equalizing bands, as Dr. Jackson calls them, in the case in which he retracted the teeth, I cannot conceive how, as he describes the application, it can do anything else than draw the lower teeth forward more than it will retract the upper. By the use of

the anchor band attached to the molars and holding the arch firmly, ligated to all the teeth, the incisors included, you can produce the forward or backward movement of the teeth in the opposite arch. If you hold the teeth in position by ligating them to the lower arch, they will hold exactly where you want them, and all the force of the elastics will be applied to the upper teeth.

With regard to the extraction of teeth, I know that Dr. Jackson deprecates such a procedure. He says in some cases it is justified, as in protrusion. I have seen a good many cases of protrusion of the upper teeth, and have seen a great many treated by their extraction, but have not seen one instance where it was justified. By the use of the intermaxillary elastics you can retract or reduce the protrusion of the upper or lower teeth without moving the molars back a fraction of an inch. That is, by expansion alone, sufficient room can be obtained to admit of retruding the anterior teeth as much as though the bicuspid had been removed. Now, I have never, in all the cases I have treated—and I know of many others treated in the same way—felt in one instance that the operator would be justified in the extraction of the bicuspid.

Mention was made of the Angle system. I suppose that simply refers to the Angle appliances. We of the Angle school dislike to hear that term used, and when one speaks of the Angle system we attempt to correct it, and try to make the person look at it in a different light. It is a wrong conception, this viewing of orthodontia merely as a study of appliances. The principle of the Angle expansion arch is not new; it is simply modified and reduced to more convenient proportions. The Angle school repre-

sents something more than mere appliances.

With regard to starting on simple cases, as alluded to by Dr. Baker, I think any case in orthodontia requires a great deal of thought and study. Take a case that is apparently very simple, which looks as if you have only a few teeth out of position in the upper arch; when you come to study it you find a great deal more than that. The mesio-distal relation of the upper and lower buccal teeth may be correct, and therefore you might say should not be disturbed; but in the front of the mouth, if we study it from a scientific standpoint, we might find that the condition in that region, which at first seemed so simple to treat, involved the movement of all the teeth in both arches. So I think any case means that we must study it very carefully and thoroughly, especially in young children. We must consider the type presented, and the age at which the deformity began. In some instances we are justified in leaving a result, or obtaining a result, which might be termed double protrusion, because we know that later in life, as the child grows, the face will grow into and eventually balance the prominence in the region of the mouth.

I think that the system of cribs, suggested by Dr. Jackson, is a very cleanly system, and if it would meet all requirements, it would be ideal; but in my hands, and in many others', it would fall far short of accomplishing all that I deem necessary to accomplish.

Dr. E. S. GAYLORD, New Haven. I am not in any sense an orthodontist, nor have I in any degree practiced orthodontia, but I early recognized the necessity of placing the teeth in proper position and relation to each other in the jaws. I commenced years ago sending my pa-

tients to Dr. Kingsley of New York with good results, and continued to do so until he told me that he could no longer accept my patients, having a practice that was outgrowing him to the extent that he did not feel justified in taking patients from out of the city. I then sent my patients to Dr. Farrar, with the same good results, and continued sending them to him until he told me that from increasing years and practice he was unable longer to accept my patients. I then fell back on Dr. Jackson, and he has already intimated to me that my patients are becoming a burden to him; but I want to make the statement now that I am not going to accept a turn-down from him. So that what I have to say on this subject is from the standpoint of an interested spectator, and the satisfaction I have derived in the expressions of pleasure and gratification of my patients for the past fifteen years relative to the results of the operations by Dr. Jackson. The satisfaction I have had from hearing the testimony of these patients, both young and old, is abundant compensation to me for having been instrumental in placing them in Dr. Jackson's hands. During all these years that I have been sending patients to him—I cannot enumerate them, but there have been many, and I think today Dr. Jackson has nine or ten of my patients under treatment—I have not heard a criticism upon the part of any patient as to the result obtained; it has always been absolutely satisfactory.

I would like to tell you a little episode that occurred a few years ago in this connection. A young lady was under treatment by Dr. Jackson, and the father of this young lady, as time went on, suggested to me that Dr. Jackson had not rendered him any bill, and for some rea-

son it was delayed until the case was completed. He was in the office some time after he had received the bill, and mentioned the fact to me, and I said, "I trust it was satisfactory to you." He said, "What do you suppose he charged me for that service?" I told him I had no idea, but that I trusted the result of his work and the charges as well were absolutely satisfactory. He replied that the doctor had corrected an irregularity for the girl, and so prevented her from going through life in a deformed condition, and had only charged him twelve hundred for the service. "Well," I said, "that is little enough." He said, "Yes, I would willingly have paid four times the amount for that work."

Now, gentlemen, what I am saying is simply in indorsement of the work I have seen from Dr. Jackson's hands, and I am very pleased to speak a word of commendation for his work at any and all times.

Dr. JACKSON (closing the discussion). I am pleased with the discussion of the paper, and with the way the gentlemen look upon my method.

In regard to the rotation of teeth at the same time they are being moved to position, we generally begin the rotation immediately; that is, we apply the necessary force to bring the tooth into correct alignment and rotate it at the same time.

This is usually done by cementing to the tooth a collar with a lug soldered on the lingual side. The lug is usually made of a short piece of plate metal, as wide or wider than the width of the tooth, and bent at an acute angle before soldering. Force is applied with a spring made to rest on the flat surface of the lug below the flange at the mesial or distal end, according to the direction the tooth is to be rotated. Force applied

at the end of a lug in this manner acts as a lever for causing its rotation as it is being moved into line.

In some cases, however, as where an adjoining tooth is beginning to erupt, or where we want to include the tooth in the anchorage for moving others, we would not rotate the tooth until later, and would arrange the appliance accordingly. With my system it is different from the use of the expansion bar in obtaining anchorage. For instance, if we want to move the bicuspid outward and keep the molars firmly in position, it is sometimes difficult to get sufficient anchorage with the expansion bar, as there is danger of forcing the molars inward while the bicuspid is being forced outward; but with my system we have the advantage of being able to use any number of teeth required for anchorage, even using some that are to be moved later, and we can determine beforehand how to construct an appliance so as not to interfere with an erupting tooth.

Dr. Stanley spoke of regulating teeth for little patients. I would like to ask how he regulates teeth for children with the system he practices, where the teeth are just erupting. When, for instance, a lateral incisor is erupting improperly in the arch, does he apply force to correct this immediately? or does he wait until the tooth is erupted sufficiently to attach to it a ligature, collar, or a clamp-band? There is an advantage in moving these teeth while erupting, as they can then be moved more easily. The process gets harder and firmer after the tooth is erupted, and more force is required for the movement. With my system we gain anchorage by spring-clasp attachments over the deciduous molars, and extend a small wire spring to guide the tooth to a correct position.

Dr. Stanley, in speaking of my system, used the term "crib." Crib does not apply to my present system. The crib method that I devised was the passing of a wire around the teeth of the arch, resting on the labial and lingual sides near the gum for anchorage. The wire on the labial and lingual sides was connected by short pieces of wire passing over the arch at the junction of the teeth, and united with solder. In some cases the ends of the main wire were left free to form springs for moving individual teeth. In other cases, for this purpose short springs were soldered to the wire on the labial or the lingual side. The system that I am describing today is entirely different. I term it the Jackson, or the "arm and finger system."

The doctor says that he sees his patients three or four times a week. I usually see my patients but once a week, and frequently have cases where six weeks intervene between visits. The appliances being removable, permit of thorough cleansing of the teeth and appliance.

The paper was passed, and the President announced as the next order of business the reading of the report of the Committee on Necrology. In the absence of the chairman, Dr. L. C. Taylor, the report was read by Dr. E. S. GAYLORD, as follows:

REPORT OF THE COMMITTEE ON NECROLOGY.

During the past year Dr. George E. Nettleton of New Haven has been called from earthly scenes into that higher life which knows no ending. We record his departure as the loss of one who for many years has been a consistent member of this association. For more than thirty years he has been an earnest co-worker,

honored and trusted by a large *clientèle*. His positive yet affable nature won for him more than usual the respect and confidence of all who knew him. He was also a warm friend and helper of many young men entering our profession.

The following resolutions are submitted:

DR. GEORGE E. NETTLETON.

Whereas, By the death of our friend and co-worker Dr. George E. Nettleton this association records the loss of one of its true and earnest members, one who, while of an extremely retiring disposition, was always on the alert in consideration of the association's welfare; and

Whereas, Our profession loses a representative member and an earnest worker, who for more than thirty years had been honored and trusted by a large *clientèle*; whose positive yet affable nature won for him in an exceptional degree the respect and confidence of his patients; he was also a warm friend and helper to many young men entering our profession. During many years' association, we never heard him speak a harsh or unkind word. His memory will always be cherished by this association, which will never cease to mourn his loss; therefore be it

RESOLVED, That we extend to the family of our departed brother our sincere sympathy in this hour of their bereavement; and be it further

RESOLVED, That these resolutions be spread upon the records of this association and a copy sent to his family.

There has also been removed from our midst during the past year one in the prime of his life. Death, who it would seem should have left him to have fulfilled what seems to us the full mission of life, has without warning removed one of our members, Dr. William H. Cahill of Hartford, a graduate of the Philadelphia Dental College, about thirty-eight years of age. For several years he has been a member of this association, al-

though not active in society work, and his death is mourned by his many friends.

The following resolutions are submitted:

DR. WILLIAM H. CAHILL.

Whereas, It is with regret that we have learned of the death of Dr. William H. Cahill of Hartford, which occurred on August 15, 1905; therefore be it

RESOLVED, That in the death of Dr. Cahill the association has lost a conscientious, kind-hearted member, and one who although not so active as some in the affairs of the association, was always in sympathy with its best interests; and be it further

RESOLVED, That these resolutions be placed on the records of the association, and that a copy be sent to his brother.

Respectfully submitted,

E. S. GAYLORD, *Chairman pro tem.*

Dr. McLEAN moved that the report of the Committee on Necrology be accepted as read.

The motion was carried.

The Committee on the President's Address was next called upon.

Dr. C. W. STRANG. In so far as the recommendation contained in the President's address regarding raising the dues is concerned, your committee has carefully considered the matter, and after due deliberation would recommend that the annual dues be increased one dollar, and so raising them to three dollars per year. I would suggest that this be presented to the society in the shape of a resolution, to be acted on finally at the next annual meeting.

Dr. G. O. McLEAN then presented the following resolution:

RESOLVED, That Article 4, Section 1, shall be changed to read: "Active members shall

sign the constitution and pay an admission fee of three dollars, and annual dues of three dollars in advance."

(Laid over for final action until next annual meeting.)

REPORT OF THE NOMINATING COMMITTEE.

The report of the Nominating Committee was next in order, which report was as follows:

President—A. W. Crosby, New London.

Vice-president—F. Hindsley, Bridgeport.

Secretary—E. S. Rosenbluth, Bridgeport.

Assistant Secretary—A. V. Prentis, New London.

Treasurer—W. O. Beecher, Waterbury.

Executive Committee—F. T. Murlless, Jr., Windsor Locks; F. W. Brown, New Haven; and F. J. Erbe, Waterbury.

Motion was made and carried that the report of the Nominating Committee be accepted, and that the secretary be instructed to cast one ballot for the entire list of nominations for the ensuing year.

Drs. Gaylord and Brown were asked to conduct the new president to the chair.

Dr. GRIFFITH, in retiring from the office of president, said:

Dr. Crosby, I am very glad to turn over to you the duties and responsibilities of the office which you are about to occupy for the coming year, trusting that the support and encouragement which has been accorded me will also be yours. Because of our faith in your ability to conduct the affairs of the association we have no hesitancy in committing those affairs to your care for the ensuing year. I congratulate you.

Dr. CROSBY, in accepting the office, said:

If I am to be fortunate enough to receive the support and encouragement accorded the retiring president, and fortunate enough to make the meeting in New London as successful as this one has been, I shall be very proud. Gentlemen, I appreciate the compliment you have paid me in electing me to this office.

Dr. McLEAN. I move that a vote of thanks be extended to the various essay-

ists and clinicians and the retiring officers for their efforts in making the meeting a successful one. I would also like to include in that a vote of thanks to Dr. Anthony, the *Cosmos* reporter.

The motion was carried.

There being no further business before the association, motion to adjourn until the next annual meeting was made and carried.

THE CLINICS.

Dr. H. E. HOSLEY, Springfield, Mass.
 "Method to Prevent Shrinkage in Soldering Bridge Work."

The clinician claims that the reason of a bridge binding is because of the shrinkage in soldering, and to overcome this he cuts the model, and spreads the abutments apart sufficiently to allow for such shrinkage. The space, of course, is in proportion to the size of the bridge to be made. A groove is made at the bottom of the model to insure the proper position of the abutments when the model is again fastened together.

Dr. W. B. DUNNING, New York, N. Y.
 "Manipulation of Non-cohesive Gold on the Wedging Principle."

The instrument used in this clinic was a sharp four-sided wedge-shaped plugger—a single joint without serrations—and the gold used was Abbey's foil No. 4. The gold was rolled by hand into the form of pellets, and packed vertically against the walls of the cavity, finishing the wedging process toward the center. A liberal surplus was worked down to a hard dense surface by alternate wedging with the instruments named and rolling by means of a finishing bur, under hand pressure. The method was recommended for small, simple cavities, in which perfect adaptation of gold to the cavity walls may be quickly and easily

obtained, the resulting filling being dense and in every way serviceable.

Dr. A. J. CUTTING, Southington, Conn. "A Process of Burnishing Gold."

Dr. Cutting's method consists of using either cylinder or foil, and with smooth points of suitable shapes that will reach every part of the cavity, of rubbing or burnishing each piece to place. Anneal the gold as required and use blued instruments, made so by the application of heat. No larger piece of gold should be used than one that can be thoroughly condensed by the pressure of the burnisher.

Dr. M. R. BRINKMAN, Hackensack, N. J. "A Simple Method of Replacing Broken Facings on Crowns and Bridges."

The instruments necessary for the clinician's method consist of two drills—one for the regular handpiece and one for the right angle—one die, one tap and holder, one wheel bur, and one pair of pliers.

To repair a facing proceed as follows: Cut the pins from the backing, and with a small carborundum stone slightly concave the backing so that the facing will bear firmly on the edges of the former. Select the proper tooth. Hold it carefully in the required position, and mark with a pointed instrument the exact points to

be drilled in the backing. Drill the holes, slightly diverging from the center, then use the tap to cut the thread in the latter. With the wheel bur cut a groove on the palatal side of the backing, between the holes, for clinching the pins. Take the die, and cut a thread on the pins of the tooth. At this stage of the process the tooth will be ready for cementing to place. Mix the cement fairly stiff, apply to the backing, and force the facing firmly to place. Hold it in position, and with the pliers pinch the pins into the groove; allow the cement to set, and then grind the pins flush with the backing. This completes the operation.

The special point of retention which differs from those in other methods is the interlocking of the thread on the pins with the thread in the holes of the backing. Two other points of retention are the cement and the clinching of the pins, which have been in vogue for some time. By using a small inverted cone bur, and cutting out the cement on both sides of the pins, a gold or alloy filling can be inserted in the backing, although it is not absolutely necessary for the permanent retention of the facing.

GEORGE T. BAKER, Boston, Mass.
(Chair clinic.) Demonstration of Use of Thymoform: (a) Permanent Root-Fillings; (b) Disinfecting Dressing for Infected Pulp-Canals; (c) Mummifier.

The patient presented a lower right first molar, which had caused him considerable discomfort for a long time. Almost the entire crown had been lost by caries. The caries had progressed to such an extent that the floor of the pulp-chamber, as well as the sides of both the anterior and posterior canals, were perforated. The roots were mere shells. There

was not enough tooth-substance left to warrant the attempt to save it. In addition, the root was the seat of a chronic alveolar abscess with fistula. The whole tooth was in such a bad condition that for the best interests of the patient the question of extracting the tooth was seriously considered. Had there been sufficient tooth-substance to warrant its salvation, the perforations of the chamber and root-canal walls could have been capped with gutta-percha, while the abscess sac on the roots and the infected periapical tissue would doubtless have yielded to proper treatment. However, the interests of the patient are paramount, and we shall not attempt to save this tooth.

It will nevertheless serve to illustrate the use of thymoform, which consists of a liquid and a powder. The former is a five per cent. solution of thymol in glycerin, while the powder is a chemical combination of thymol and formaldehyd, mixed with absolutely pure zine oxid. The proportion of the former to the latter is approximately five per cent. This agent disinfects by the slow diffusibility of the thymoform, which, as already stated, is formaldehyd in combination with thymol.

The fluid being hygroscopic, the moisture of the canaliculi is disinfected, and the whole tooth is thus rendered aseptic.

It is interesting to note that the periapical infection has been brought about by the infectious material of the decomposing pulp gaining access to the periapical tissues through the foramen. Now, where these infectious elements have penetrated, the disinfecting formaldehyd will as surely follow. The result will be the destruction of all pathogenic germ life, an effectual removal of the cause of inflammation; and once the cause is

overcome, one may confidently expect a return to normal conditions. The conditions of pulpless teeth are so varied that good judgment must be used in all cases. No two cases are ever exactly alike. If there be a fistula present, it is well to force a mild caustic fluid through it until it appears on the gum. In the case of an upper molar or bicuspid, due care must be used not to enter the antrum, and in the case of a lower third molar one must remember that the inferior dental nerve is often in very close proximity to the apical foramina. It is proposed to fill the lower left second molar, which is badly decayed, though the pulp is not quite exposed. The anterior and posterior occlusal cavities were united into one. The soft cheesy dentin immediately over the pulp was bathed with a solution of silver nitrate, ten grains to the ounce of water. The dentin was dried, and coated with a varnish of resin and chloroform. A very thin capping of gutta-percha was introduced to guard against thermal changes, and the cavity filled with amalgam.

Dr. WALTER H. ELLIS, Buffalo, N. Y.
 "Duplication of Models" (elastic molds).

Materials. (1) One-half pound best grade French gelatin. (2) Stearin mixture (2 dw't. stearin, 1 oz. kerosene) for painting molds to prevent the gelatin from adhering to the cast. (3) Alum-water prepared by dissolving one-half pound powdered alum in one teacupful of boiling water. (4) Soapstone to be dusted on cast to preserve whiteness.

Synopsis. (1) Brush thoroughly the cast to be duplicated with powdered soapstone. (2) Coat the inside of the wooden

case with the stearin mixture. (3) Stick the cast to hinged portion of the case by means of a pellet of gum or elay, then shut the case and clamp it. (4) Melt the gelatin in a double boiler, in the proportion of two teacupfuls of hot water to one-half pound gelatin. Stir the mass while melting it, and when thoroughly melted remove it from the fire, and cool to a degree where it feels neither hot nor cold to the finger. (5) Pour the gelatin into the case through the hole in the roof of the case; let the mass stand for seven or eight hours, preferably over night, until it has hardened.... (6) Remove the mold from the case and work the cast carefully from the mold. (7) Allow the mold to stand for one-half hour to harden, and then return it to place. (8) Brush the surface of the cast with soapstone, and then with the alum-water. (9) Give the mold a light coating of stearin mixture. (10) Run the first duplicate. (11) Watch carefully, and as soon as the plaster has set, and just before the heat incident to the setting begins to be generated, remove it from the mold, as any degree of heat injures the latter. (12) Give the surface mold a dusting of soapstone, and a coating of stearin mixture previous to the running of each duplicate. About six duplicates (good ones) can be made from one mold.

Dr. P. B. McCULLOUGH, Philadelphia, Pa. "The Artificial Substitution of a Single Missing Central or Lateral Incisor." (This clinic was later made the subject of a paper read by Dr. McCullough before the New York Institute of Dental Technique, and will be found in the Transactions of that body for 1906.)

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Connecticut
State Dental Association

AT ITS

Forty-third Annual Convention

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NEW LONDON, CONN.

April 16 and 17, 1907.

PHILADELPHIA :
THE S. S. WHITE DENTAL MANUFACTURING CO.
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TRANSACTIONS
OF THE
Connecticut State Dental Association,
AT ITS
FORTY-THIRD ANNUAL CONVENTION,
HELD AT
New London, Conn., April 16 and 17, 1907.

TUESDAY—Morning Session.

THE forty-third annual convention of the Connecticut State Dental Association was held in the convention hall of the Mohican Hotel, New London, Conn., on Tuesday and Wednesday, April 16 and 17, 1907.

The first meeting was called to order on Tuesday morning at 10 o'clock by the president, Dr. A. W. Crosby of New London, Conn.

The first order of business was the reading of the minutes of the last session, which was on motion dispensed with, on account of their having appeared in the printed Transactions, a copy of which had been sent to each member of the society.

The president, Dr. A. W. Crosby, was then presented with a very beautifully engraved gavel, the gift of the members of the society, Dr. James McManus making the presentation address.

Dr. JAMES McMANUS. I wish to announce the sad intelligence of the death of Dr. Civilion Fones' wife. We all know what a happy family they were, and what an affliction this must be to them. I move that the society send by telegraph our sympathy to Dr. Civilion Fones and to Dr. A. C. Fones.

The motion was unanimously carried, and the secretary accordingly instructed.

The next order of business was the report of the treasurer, Dr. W. O. BEECHER, Waterbury, as follows:

TREASURER'S REPORT.

WATERBURY, CONN., April 16, 1907.

April 16	Balance on hand.....	\$558.63
"	" Received from Dr. Rosenbluth (balance of exhibitors)	159.00
"	" Received from Dr. Hindsley (twenty applicants for membership)	105.00
"	" Received from Atlantic Hotel (balance of advertisements in program).....	10.00
"	" Received from A. S. Rutherford (balance of advertisements in program) ..	10.00
1907	Dues to date inclusive	310.00
April 1	Received from Dr. Rosenbluth (advertisements in program 1907)	105.00
Total		\$1257.63
Expenses to date		1036.10
Balance		221.53
April 15	Balance as per check book	219.53
	Cash on hand	2.00
Total		\$221.53

Respectfully submitted,

W. O. BEECHER, *Treasurer*.

Motion was made and carried that the report of the Treasurer be received, and after being audited, accepted if found correct.

There being no other committees to report, the next order of business was the election of new members.

The secretary, Dr. Rosenbluth, then read the following list of applications for membership in the society:

Herman Warren Stevens, Waterbury.
 John J. Bresnan, Wallingford.
 Burton E. Turney, Bridgeport.
 Walter S. Quinn, New Haven.
 Elwyn R. Bryant, New Haven.
 Albertus V. Segar, Willimantic.
 Edward F. McCarthy, Manchester.
 J. Otis Miner, New London.
 James R. Linsley, New London.
 C. R. Chamberlain, Norwich.

E. P. Fitch, New London.
 Geo. C. Case, Winsted.
 D'Alenson Caulkins, New London.
 J. C. F. Bridge, Hartford.
 Charles J. Royce, Willimantic.
 John E. Hassett, Rockville.
 John F. McGrath, Ansonia.
 Joseph A. Farrel, Hartford.

Dr. F. T. MURLLESS, Jr., moved that if there be no objection to the procedure the secretary be instructed to cast one ballot for the election of the list of applicants to membership in the society.

The motion was carried, and the secretary, Dr. Rosenbluth, cast one ballot for the list of applicants.

Dr. E. B. GRIFFITH, Bridgeport. It has been the custom of this society to include in its list of honorary members the names of worthy, capable, and enthusiastic members of the profession outside of the state. We have a gentleman from Springfield, Mass., with us today, who has been attending our meetings for several years, and who has shown a disposition to help us in many ways. It gives me, therefore, great pleasure to propose the name of Dr. A. J. Flanagan of Springfield, Mass., as an honorary member of this association.

The motion was carried.

Dr. F. T. MURLLESS, Jr. I wish to present in proper form the following proposed amendment to the by-laws of the society, which I presented last year, and which comes up for final action at this time:

RESOLVED, That the following become Article X of the by-laws of the Connecticut State Dental Association, that the present Article X be made Article XI, and succeeding articles be renumbered to correspond:

"No dentist or physician who is not a member in good standing in his own local or

state society shall present either a paper or clinic before this association, or take active part in the proceedings."

The resolution was adopted.

Dr. G. O. McLEAN, Hartford, presented the following amendment to the by-laws for final action by the society, the amendment having been offered at the last meeting of the association:

RESOLVED, That Article IV, Section 1, shall be changed to read: "Active members shall sign the constitution and pay an admission fee of three dollars, and annual dues of three dollars in advance."

Dr. ADAMS moved, as an amendment to Dr. McLean's amendment, that this amendment to the by-laws take effect on and after the third Tuesday of April 1908.

The motion was carried.

The next order of business was the reading of his address by the president, Dr. A. W. CROSBY, New London. (See following page.)

Dr. ADAMS moved that the consideration of the President's address be taken up at the afternoon session.

The motion was carried.

Motion was made and carried to authorize the president to appoint a Nominating Committee to present nominations for officers for the ensuing year.

The motion was carried.

The President appointed Drs. G. O. McLean, D. W. Johnston, and E. B. Griffith to act as such Nominating Committee.

Motion was then made and carried to adjourn until two o'clock.

PRESIDENT'S ADDRESS.

By A. W. CROSBY, D.D.S., New London.

NEW LONDON extends to the Connecticut State Dental Association a most hearty welcome on this occasion, its forty-third annual convention. Only once before has the State Association met in New London. This society was then in its infancy. The meeting must have been a small one, as it was held in the office of Drs. Sheffield and Brown.

The Connecticut State Dental Association stands for progress. Perhaps in no better way can the contrast be shown between the dentistry of the olden days and that of the present time than by reading some of the advertisements which appeared in the early New London newspapers.

In the *Advocate and Republican* of 1841 appeared the following advertisement:

E. VINCENT, *Surgeon Dentist* from the City of New York, having taken an office at Westerly, R. I., near the Washington Bank, respectfully offers his services to the public. He will extract teeth or roots of teeth with the least possible pain or fracture of the jaw. Also Mr. Vincent will cure the toothache permanently without pain; and all dental operations will be performed in the best manner.

Another advertisement, appearing in the same paper the following year (1842), reads as follows:

J. WASHINGTON CLOWES, *Surgeon Dentist*, would respectfully inform the citizens of New London and the public generally that he has permanently located his office in Smith's Building, Court st., where he will perform the various operations pertaining to his profession, whether surgical or mechanical, in a manner perfectly satisfactory to all who may confide in his professional ability. Artificial teeth, from one to thirty-two, will be adapted to the mouth; fulfilling not only the purposes of ornament but performing in a complete and triumphant manner the process of mastication.

J. W. C. respectfully refers the public to the following highly approved recommendation:

"I hereby certify that I have known J. Washington Clowes for the past three years, and that during that time he has been with me as a dental student. Thus knowing him, I am able to bear full testimony, not only to his ability to perform well and truly all the duties of his profession, but likewise to his good moral character and punctuality in his engagements, and a close attention to business. I do, therefore, without any qualification or reserve, recommend him to the confidence of my friends and the public.

"J. SMITH DODGE, *Surgeon Dentist*,

"Bond st., New York.

"June 4, 1842."

This indorsement is interesting because it shows that the best men of the profession were at that time cognizant of principles upon which our present

code of ethics is founded, although the reading of the advertisement, "fulfilling not only the purposes of ornament, but performing in a complete and triumphant manner the purposes of mastication," sounds quaint indeed.

If these advertisements have been of interest, you will also be interested in going back to a time twenty years earlier, when the following appeared in the *Republican Advocate*:

Utley's Remedy for the Toothache.

This remedy was discovered about three years since (residing in a vegetable substance) by Col. Joseph Utley, of Hartford, Conn.

The following certificates of its efficacy from men of the first respectability, given by them through motives the most humane, are submitted to the perusal of the candid reader:

"Having long been afflicted by the toothache, and dreading to have my teeth extracted, I was induced about two years since to use Utley's Remedy for the toothache. It effected an *entire cure*, and I have had no return of toothache since. Being at that time in command of the state prison of Connecticut, I applied it to the prison guards under my command, and to a number of my neighbors, with uniform success. When properly applied I believe it to be an effectual remedy.

"CHAS. WASHBURN.

"Hartford, May 1820."

"I have used Utley's Remedy for toothache in my family at various times for two years past, and most cheerfully recommend it as an effectual *preventative* of that malady.

"WARD WOODBRIDGE.

"Hartford, May 1820."

"Three years ago I was much troubled with the toothache. I applied Utley's Remedy, and have not been afflicted with any pain of the teeth since.

"FREEMAN KILBOURN.

"Hartford, May 1820."

Pleasant as it is to linger in the past, our time is so limited that we must forego that pleasure and proceed to the questions of the day.

The very able Legislative Committee of our society recently took upon its shoulders the task of strengthening our dental law. There were two or three noteworthy changes among the half-dozen recommended.

It was recommended that the governor appoint, before the first day of July 1907, five Dental Commissioners—one for five years, one for four years, one for three years, one for two years, and one for one year; and that annually thereafter, before the first day of July, one commissioner shall be appointed, who shall hold his said office for a term of five years from the first day of July next succeeding his appointment. These appointments were to be made from a list of names furnished the governor by the Connecticut State Dental Association.

Section 3 was strengthened by inserting the words: "In the manner provided by said commissioner," in place of the words "Pursuant to the laws in force at the time of their license or registration," thus legalizing the action of the commission requiring all who were in practice to have registered prior to December 1, 1892, and eliminating any ambiguity as to its interpretation.

Section 2 was stricken out, and the following substituted:

"All unlicensed assistants who, on January 1, 1907, were actually employed in performing dental operations on patients in the office of a duly registered or licensed dentist, may register their names with the Dental Commission prior to October 1, 1907, upon the presentation of the affidavit of two registered

or licensed dentists, stating the name and address of such applicant, and the length of time he or she have been so employed, in such form as the Dental Commission shall prescribe. Any person so registered as aforesaid may perform dental operations on patients in the office of a licensed or registered dentist, and under the immediate personal supervision of such registered or licensed dentists, but not otherwise.

"The provisions of this chapter shall not prevent a physician or surgeon, practicing as such, from the performance of any operation in dentistry on a patient under his charge, or a visiting clinician at a meeting of a regularly organized dental society from performing dental operations, nor an assistant of a registered or licensed dentist from performing the so-called operation of cleaning teeth."

Modern dentistry is a most comprehensive subject, and there are any number of topics to which I could invite the attention of the Connecticut State Dental Association, but there is one subject so new that it savors of radicalism; so new that it takes some courage to bring it before a convention in the year 1907, knowing full well the criticism and opposition which it will meet before it achieves that approval which it will surely win when the public become enlightened as to its importance.

The subject of which I wish to speak is "Examination of the Teeth of School Children." People are at first prone to say that public supervision of children's physical welfare smacks of paternalism, and parents bristle with resentment at this action *in loco parentis*. But further thought carries with it the conviction that the physical betterment of school children no more savors of paternalism than does their mental betterment. The Germans have a saying that "One hand washes the other," and in no way is this proverb more aptly applied than in the

interrelation of sound mind to sound body.

The school teacher's task is universally acknowledged to be an arduous one, but his—or more often her—labors would be manifestly lightened were all pupils bright and none stupid.

The examination of the eyes of school children, now so commonly enforced, has brought to the front bench pupils who on the back seat seemed stupid. Likewise the deaf pupils, after examination, given as it now is in many public schools throughout the country—these deaf boys and girls, I say, have been made to hear.

A busy teacher in the whirl of the modern curriculum is less apt to see a physical than a mental defect. The teacher should therefore be aided in improving the physical well-being of the pupils, if the boys and girls of today are to be what Wendell Phillips described them in 1824, on the occasion of Boston's reception to Lafayette. He said, "The city gave him the best it could afford, the sight of its school children."

Now, how shall we as dentists help to bring the school children to their highest physical efficiency, that the boys and girls of today may indeed be Connecticut's most distinguished possession?

We dentists are as truly our brothers' keepers as is the oculist or aurist, and it is as much our duty to enlighten the public upon the evil of an unclean mouth, of the very great evil of extraction, and of the disastrous effects of adenoids. There is less need to speak of carious teeth, their discomfort bringing its own remedy.

I am unable to learn of any state which fully looks after the physical welfare of its school children. Most of them have laws which look after contagious

and infectious diseases. Connecticut has a law which requires the annual examination of the eyes of its school children: Massachusetts includes the ear. In New York city the Board of Health, under Dr. Darlington, is doing the finest work in the country for the care of its school children. The *modus operandi* is this: The child is examined by the school physician when it first presents itself at the school. If the physical condition is not up to the standard, the child is sent home, and a post-card, with a paid reply attached, is sent to the parents or guardian, stating what the defect is and recommending that immediate attention be given by the family physician or dentist. If the family be too poor, the school physician will perform the service. The notice requests that the reply card be taken to the physician or dentist, who in turn mails it back with the blanks filled in, showing that the matter has received attention. If the case be neglected, the school nurse calls on the parent, explains the desirability and benefits of treatment, and urges that the case be immediately attended to. If the parent is unable to have it done, permission is procured to have the school physician do it.

Here is where a free dental clinic will be of inestimable value. Data is now being obtained for that purpose, and to show the need of the appointment of a dentist on the board of health. Dr. Herbert Wheeler and thirty other prominent dentists of New York city have formed an association to support the undertaking. This work is being carried on by a committee consisting of several physicians and a dentist, men interested in

sociological work, Dr. Wheeler being the dental representative. They work under the Association for the Improvement of the Condition of the Poor.

A dental clinic has been established in the Fifty-third Street Industrial School, and has the financial support of the Children's Aid Society. The teeth of the children in this school are not only examined, but inflamed gums and putrescent pulps are treated, teeth filled, and when necessary, teeth are extracted. The fillings are plastic only. Statistics already obtained by the committees show that seventy-six per cent. of the children have never been to a dentist.

Dr. G. H. Cronin of the board of health, said, in a recent address, that 30,000 out of the 300,000 school children in Manhattan were backward. They proved on inspection to be unable to see distinctly, to hear properly, to breathe well—on account of growths in the throat, or to be suffering from some defect. Dr. ——— of the same board said that twelve per cent. of the pupils suffer from adenoid growths, and so are mouth-breathers. This defect is easily corrected by a comparatively painless operation, and the pupil is usually back in school in from twenty-four to forty-eight hours. In five or six weeks the little patient is changed from a stunted, stupid, putty-faced, lackadaisical child, who can keep its mind concentrated on one thing but for a few moments at a time, into a rosy-cheeked, bright-eyed child, who is able to keep up with his class and is tractable in disposition.

"A child suffering from any of the ailments mentioned, misunderstood by the teacher—who most frequently supposes it to be stupid—and ignored by the unenlightened parents, conduces to il-

literacy, to complete nervous breakdown, and finally to insanity."

In New Jersey a committee of twenty dentists, appointed by the state society, have succeeded in a number of places in securing permission to examine the teeth of the school children. Duplicate charts are made out, one being left with the principal of the school; the other is sent to the parent, if dental services are required, suggesting that the child be taken to the family dentist to have the necessary work done.

Dr. Means, president of the school board of Cincinnati, Ohio, was convinced that the reason most of the backward—and even incorrigible—children did not do better, was because they were suffering from some physical defect which was remediable; that these children were ill, and more to be pitied than driven. Many of them were told by their teachers that if they did not do better they would fail to pass to the next grade. They became discouraged and thought they were not as bright as were other pupils; some of them became truants, fell in with the "gangs"; from that into petty thieving, and finally became confirmed criminals. He contended that it was more economical, and money better spent, to examine the children and correct these defects, than to build great penal institutions. If these children did not all turn out brilliant after treatment, they would, at least, grow up self-supporting and respectable citizens.

About five hundred who were incorrigible, who were doing poor work or who failed to pass the successive grades, were examined, and ninety-five per cent. were found to have some defect of the eye, ear, throat, or nose. The percentage in New York city proved the same on a similar examination. Unfortunately, Dr. Means

does not seem to have thought to get statistics on the disorders caused by not being able to properly masticate food—either because of carious and diseased conditions or malocclusion of the teeth. Nor does he take into account the pernicious effect, on the digestion, of a filthy and germful mouth.

In Strasburg, Germany, in the public schools, out of 12,691 pupils whose teeth were examined, 7065 had teeth extracted.

I am not advocating the "odontocide," but proper treatment of the teeth results in speedy banishment of such unpleasant afflictions as headache, earache, toothache, and even that bane of adolescence—stomach-ache.

Examination of the teeth of school children in Hochheide, Germany, is very suggestive. Only 35 out of 1020 children had sound sets of teeth. In 396 children, poor physical condition was attributed to poor teeth.

In this state there are signs of an awakening. In Hartford a committee from the Hartford Dental Society met with favor when they presented the subject of examination of the teeth of the children in the public schools before the board of health.

In New Haven Dr. F. W. Brown, in his examination of the teeth of children in four of its public schools, under the direction of the Mothers' Club, found that seventy-five per cent. of the children needed the services of a dentist.

In New London the matter is about to be presented to the school board. This leads us up to the necessity of establishing free dental clinics in the several cities of the state.

New Haven, I believe, has the only one at present, but if the teeth are to be examined, and the necessity shown for the care of the teeth as an important factor

in the health of an individual, some provision ought to be made whereby the teeth of the poor children could be cared for until such a time as they are self-supporting.

In fine, I recommend that in each locality steps be taken with either the school board or board of health to have the teeth of the children in its school examined twice annually. Where there are local dental societies this should be done under their direction; and where there are none, under the individual direction of members of the state society free dental clinics should be established wherever possible, and carious and putrescent conditions of the teeth, with diseased conditions of the mouth and gums, be treated, and the teeth cleaned.

Far more attention should be paid than now to children suffering from adenoids, with the attending effects of chronic catarrh, crowded teeth, deformity of the chest, and deficient oxygenation of the blood.

Physical betterment is already recognized as a financial asset. It has been said that an increase of five per cent. in the economic value of working men in Germany, under fifty years of age, would pay for the standing army. In England, many men who have had army training are paid twenty-five per cent. more than current wages in their trades.

In business and professional life today intense competition taxes the energies to an ever-increasing strain. Therefore bodily activity, dexterity, presence of mind, and endurance to fatigue go far toward compensating defects in education. As though it were necessary to further emphasize what none need tell-

ing, I will quote what one vigorous modern thinker, the Rev. Percy S. Grant, said recently in an article in the *North American Review*, on Physical Deterioration of the Poor: "Health is the best mentor; a sick, devitalized man is restlessly driven to all sorts of substitutes for strength—to drink, to pleasure, to passion—in fact, to any excitement that momentarily excites his energies. Health has no need of narcotics, and will hold a man to a reasonable manner of life."

I will close by adding from that book, so true that it seems ever new, Herbert Spencer's "Education": "Perhaps nothing will so hasten the day when body and mind will both be adequately cared for as a diffusion of the belief that the preservation of health is a duty. Few seem conscious that there is such a thing as physical morality. Men's habitual words and acts imply the idea that they are at liberty to treat their bodies as they please. Disorders entailed by disobedience to nature's dictates they regard simply as grievances, not as the effects of conduct more or less flagitious. Though the evil consequences inflicted on their dependents and on future generations are often as great as those caused by crime, yet they do not think themselves in any degree criminal. It is true that in the case of drunkenness, the viciousness of a purely bodily transgression is recognized, but none appear to infer that if this bodily transgression is vicious, so, too, is every bodily transgression. The fact is that all breaches of the laws of health are physical sins. When this is generally seen, then, and perhaps not till then, will the physical training of the young receive all the attention it deserves."

DISCUSSION.

Dr. JAMES McMANUS, Hartford. I would like to say a few complimentary words regarding the President's address, but what I want particularly to say is in commendation of his remarks on the question of the examination of the teeth of school children. In addition to this, I want to say what probably but a few of you know, that Hartford stands first—I think even ahead of New York in a certain way—in the matter of doing something, having the sanction of the city officials, with regard to the examination of the teeth of school children. For some two years we have had a dentist on the school board and a dentist on the health board, and they, together with the committee of the Hartford Dental Society, have worked in such a way that there is every reason to expect that this autumn there will be something done, definitely and officially, in the way of the examination of school children's teeth, in order that the teachers of the public schools should instruct the children in mouth-cleanliness and the care of the teeth. I think Hartford dentists have a right to be proud of the fact that their efforts have the official support of the city, and whatever they attempt will be done, I think, thoroughly.

The reading of the report of the movement in New York was very interesting. I saw what was probably a synopsis of that same report—which the president gives us more fully—in one of the New York papers several Sundays ago, in which I was very much interested, and which shows that they also are doing good work. But whether or not it is

being done officially I do not know, and I could not quite catch that point in the address—that is, whether this was an official action or whether it was the independent action of certain men in the profession to forward the movement.

I have always claimed that if we have the right to send examiners into the schools for the purpose of examining the eyes, for the purpose of vaccinating the children, or for any other purpose, we should have as much right to insist that the mouths of the children be examined and the pupils given instruction as to the manner of properly caring for their teeth.

Dr. A. H. SPICER, Westerly, R. I. One of the most interesting addresses we have had for years is the one to which we have listened today. Dr. Crosby has given us some very important historical data with regard to dentists in the old days. I wish to say with regard to Dr. Vincent, who located in Westerly, that I am the proud possessor of the turn-keys with which he turned out teeth painlessly.

Dr. F. W. BROWN, New Haven. The portion of the address that interested me most was in reference to dental education in the schools, something I have been interested in for the last two or three years. I started in that line of work by reading a paper upon the care of the teeth before the New Haven Mothers' Club, and since then I have drifted into reading papers before the different public schools. A number of schools have what they call parents' afternoon, which the parents of the school children are invited

to attend, and at these gatherings different professional men are invited to read papers. Upon such an occasion I was asked to read a paper on the care of the teeth, which I did, and I was very much surprised at the interest manifested by the parents. I also found the children becoming interested in the anatomy and care of the teeth.

After reading the paper I started in to examine the teeth of the children, and found that quite seventy-five per cent. had never had any dental care. This was a most deplorable condition; it seemed to me that the parents had neglected taking care of their children's teeth. A large majority of the parents seem to think that treatment and general care are useless in the case of the first teeth, because in any event they must soon be lost. When it was shown to them in the proper light—that the child cannot masticate properly unless he has good teeth, and also the reasons why the deciduous teeth should be retained until the time for the eruption of the permanent ones—it seemed to awaken a new interest in their minds. At the last school in which I made examinations, I think there were about fifty parents present. The examination of the children was not compulsory, but when I finished that afternoon I think I had examined about all the children's teeth in the school. This is a subject in which the children and teachers are very easily interested, and I am glad to see that Dr. Crosby has started a movement in the right direction. It seems to me that going into the schools and instructing the children in the care of their teeth will be of great benefit to them.

With regard to the suggestion of having a dispensary, while we have one in New Haven, I find it a very difficult mat-

ter to induce the better class of poor people to go there, on account of the objectionable foreign element that demands treatment at the institution. Almost the first question they will ask you is, What class of people do you have there? I hope the local societies will take up this matter, and that the dentists will go into the schools and educate the children in the care of their teeth, and that good results will spring from what Dr. Crosby has said today.

Dr. E. WHITFORD, Westerly, R. I. I regret very much not having heard the paper, but the remarks of the last speaker have given me the opportunity for which I have long looked, that of saying something in regard to the attitude of parents toward the teeth of children. I was asked some time ago to address a mothers' circle on this subject, and during a talk, of say one hour and a quarter, I had an apparently very much interested audience. I was astonished, however, to learn that the most simple ideas—and I gave nothing but common-sense ideas—about the care of the teeth were revelations to the mothers present. One lady, who is well respected and highly educated, seemed very much surprised at some of the ideas suggested, and asked me the question, "Do you mean to say that children's first teeth ought to be cared for until the second teeth come?"

The speaker who preceded me said that seventy-five per cent. of the children's teeth were not cared for. I think I could go farther than that, and say that seventy-five per cent. of the mothers do not give half the care to their children's teeth that they ought to have. We, as dentists, I think have a great responsibility in that direction. Anyone who has practiced dentistry long knows that he has to depend largely upon lady patients

for his practice. A great majority of these lady patients are mothers, and we have the opportunity of instructing them along this line, and I think it is our duty to do so. Some men may think that we will probably acquire a reputation similar to that of the average barber, of being too loquacious, but I do think that we do not talk sufficiently along the right line.

Dr. A. J. FLANAGAN, Springfield, Mass. For fifteen years I have been listening to discussions of the question of dental education of the public and dental inspection of the mouths of school children, and what has it come to? We have been doing a lot of talking, but what are we accomplishing? Did it ever occur to you, gentlemen, how medical inspection reached the schools? Do you think for a moment that they did it by talking alone? That one individual did it? Not at all. Did you ever stop and think that medical men were the cause of having medical inspection in the schools? Now, we have been talking for fifteen years; we are still talking, and have accomplished nothing of a practical nature—and that to me is the most irritating thought. You have here in New London a dental society which represents a certain area; you also have in this area a medical society which represents that area; have you medical inspection in the schools?

Dr. CROSBY. No.

Dr. FLANAGAN. Well, we have in Springfield, and in many other places in Massachusetts. Not only have we this inspection, but the physicians are paid for doing it. Now, how did they do that? They did it by taking a hand in politics—if you want to call it that. This has come about by putting a physician at the head of each board of health—find-

ing out what that physician's ideas were before he was elected. When that man obtained his position on the board, what did he do? He made sure that his friends in the medical society would help him in this matter of medical inspection, and by educational campaign methods soon secured results.

Now, if the dentists are, as Dr. Horatio C. Wood once said, men of partial culture, they should at least have partial knowledge of politics. If physicians can do all this legitimately—and if legitimately it must be ethically, and I have not heard it questioned ethically—why is it not our duty to elect dentists to the board of health—men who have force of character, men fit for the position, and whose opinions would be upheld by the public and the profession. If we had only done more practical work, we would not have been talking for fifteen years for nothing. I claim that the whole trouble lies not with the public, not with the physicians, but with the dentists. They are doing little more than talking.

Another thing. Someone spoke of educating mothers, educating children, educating the public in the care of the teeth. You have in every hospital of any consequence at the present time a training school for nurses. Have any of you gentlemen here had the honor of going before a class of nurses in one of these hospitals, and talking on the care of the teeth? I know of but one place where that is done, and that is in Springfield, Mass. There are three training schools for nurses there, and at one of these schools, twice a year, lectures are delivered on the care of the teeth; and that, gentlemen, was brought about by one man making an effort. If you have training schools for nurses, and they have lectures on medical subjects, why not have

lectures on dental subjects, along lines of help to nurses and to the public? Nurses, above all others, need to know something of the care of the teeth and associate parts, in health and in disease.

Dr. CROSBY (closing the discussion). In reply to Dr. McManus, who said I did not make quite clear the status of this movement in New York, I would like to say that the present examination of children's teeth, as well as other examinations for their physical welfare, is made by the school physician. The movement of Dr. Wheeler and his associates is for the purpose of accumulating statistics that will show the need for the appointment of a dentist on the board of health. They did not feel that they would be justified in asking to have that done without first collecting statistics that would demonstrate the necessity for having a dental representative on the board. Another thing that impressed me in regard to teaching children to take care of the teeth and so establish a state of hygiene, is that

they look upon it as a matter of polish, somewhat as they look at the matter of blacking their shoes. They know that it makes them look better, but what is the use? They do not look at it as a matter of consequence to their health, a point that should be impressed upon their minds.

In the care of the infant's mouth after feeding, the mother feels that she must wipe out its mouth or the baby will have colic. Now, as the child grows older and more vigorous, although, better able to throw off the marked effects of fermentation in the mouth, still he will suffer from digestive troubles. Digestion is considerably impaired by decay of the teeth and food-decomposition in the mouth. Precaution against these evils would make the child grow up stronger and with better health. The general physical condition of the child is improved by dental prophylaxis, and it seems to me that it would be well to educate the mothers and children in regard to these points.

TUESDAY—Afternoon Session.

The afternoon session was called to order by Dr. F. T. Murlless, Jr., chairman of the Executive Committee, at two o'clock.

The first order of business was the discussion of the President's address, postponed from the morning session.

(Discussion printed at page 10, following the address.)

The next order of business as announced by the President was the reading of a paper on "Our Old Stand-bys," by Dr. EDWIN WHITFORD, Westerly, R. I. (See following page.)

OUR OLD STAND-BYS

By Dr. EDWIN WHITFORD, Westerly, R. I.

WE all know what an amalgam filling is—or what it should be. We must know the uses of cement in combination with amalgam, and very probably all of us, by employing the latter, have restored teeth to their normal occlusion and usefulness. Inasmuch as the few ideas expressed in this paper are along this line, I cannot claim that they are absolutely new, although I believe I carry the idea of restoration somewhat farther than usual; and as I found out the method for myself, I call it new.

Let us take for our example a badly broken-down molar, with the crown and walls nearly or quite gone. If we are inspired with an ethical suggestion, it is to restore such a tooth to its natural usefulness. How? And here arise two conflicting ideas—as to whether it shall be a gold crown or an entire restoration by filling. Perhaps the gold crown is suggested by the patient, under the impression that it will wear well, and the dentist may second the idea because it will please the patient; perhaps there is a feeling of security on the part of both dentist and patient that the work will endure because the carious crown will be entirely covered up—and right here I wish to say that I should prefer to call it buried, for only too often the crown becomes a sepulcher.

On a tooth which is broken down to the gingival margin, a gold crown cannot be placed to stay without either gingivitis, pericementitis, or death to the pulp resulting therefrom. That is not permanence.

Suppose it is a doubtful tooth so far as the health of the pulp is concerned. You cannot consistently test it for a gold crown, for many times a pulp that will thrive under certain filling materials will die under a gold crown, because it is *buried* and *ought* to be dead. I have known of cases where, as a precaution against this possibility, a tooth has been devitalized. Against this practice I must enter my protest.

Enough for the golden sepulcher! What shall be done? Build the crown up. How? An inlay? Perhaps, but, gentlemen, if I were obliged to speak on inlays I should not be here, for there are too many of our learned brothers who have forgotten more than I shall ever know upon that subject. Remember also that this may be a tooth without a wall, and from my unenlightened position it occurs to me that there is always a line of cement exposed in inlay work, which, if we try to avoid, results in more or less inaccuracy and guesswork.

I am aware that quite a number of dentists would stake their reputation on

the porcelain and gold inlay. Doubtless they have the best of reasons for their opinion, and I admit that in certain cases the inlay will answer the purpose admirably. From an esthetic point of view a porcelain inlay, perfect in its color, is often indicated for anterior teeth, even if it must be replaced within six months, but for molars—and, in cases where they are not exposed to view, bicuspid— which are to be restored permanently, I employ that which, for want of a better name, I call an amalgam crown. We have all seen, and perhaps all of us have removed, a splash of amalgam from the cavity of a tooth, made to stay in position by some most barbarous pits and undercuts, with caries as the ever-present and accompanying feature. To such a use of amalgam we are unanimously opposed.

If the tooth be sensitive, the vitality of the pulp is first thoroughly tested. If the pulp be infected, I treat it or devitalize it, although if the pulp be nearly exposed but covered with healthful dentin, I cover the floor with a non-irritating lining of cement. In order to test the vitality of the pulp I insert a soft gutta-percha filling, and if the tooth remains comfortable for one or two weeks no fear need be entertained of subsequent difficulties arising.

After removing all imperfect tooth-structure I use a small stone or disk to bevel the walls toward the gingival margin. I then fit around the tooth a seamless copper band, such as that manufactured by the Ransom & Randolph Co. By annealing the band, and if necessary beating it out thin, it can be made to fit very tightly, and can easily be stretched to conform to the outline of the tooth. I usually fit the cap as far under the gum as a gold crown would be carried—at least half a line. I do so

because I may in that way be sure that the band reaches below the cavity, thus insuring stability and exclusion of moisture. A mix of medium-setting amalgam is now prepared, which should be dry and crumbly when put in, except the first small piece or two, which may be softer. For covering the pulp a material of the nature of Iodoformagen cement should be given the preference, as the zinc oxy-phosphate will more readily adhere.

The floor of the cavity and the inside of the walls—but not the beveled portion—are lined with a thin layer of quick-setting cement. I wish to emphasize these two points, because I notice that most failures in combination fillings arise from the use of too much cement. Gently press into the cavity the first particles of amalgam. If any cement exudes, wipe it away, and with it any excess of mercury. There is no need for hurry now, if the tooth can be kept dry. The cement lining is next covered and the pulp protected. Fill in with the already hardening amalgam on the bevel next to the band with considerable pressure, causing it to become united with the first amalgam, and fill to a full contour. If convenient to both patient and operator, the band is removed the same day; if not, no harm can come from waiting. Be sure that the amalgam is thoroughly hard before removing the band, which may be done by use of a small stone or fissure bur. After removing the band polish off the excess at the beveled margin with small stones, disks, etc., burnishing toward the gum. Then polish with cuttlefish disks, inspect the occlusion and the interstitial spaces once more, and otherwise complete the operation.

I have restored many teeth in this manner—some after devitalization, some after covering the pulp, some after

and some without testing the vitality of the pulp. I have practiced the method for nearly four years, and have never had a tooth die or an amalgam crown break or fall off; nor for any reason have I been asked or felt obliged to remove one, and, if I were, do not know how I should do it, for it is on to stay. This method is quicker than an inlay, less harassing to the patient, stronger, and surer.

In regard to pulp-preservation, while I do not believe in trying to preserve a naked or bleeding pulp, I know that a cavity can be excavated to almost a transparency over the pulp, and if that thin layer of dentin be normally healthful the pulp can be preserved by use of a proper covering. But as this is not a dissertation on so-called "pulp-capping" I prefer

to leave this question to the discretion of the operator, although I am convinced that many pulps are devitalized uselessly because, in their close proximity, cement is looked upon as a destroying angel instead of a means of grace.

Perhaps much of what I have said is old to you, hence the first part of my remarks. I have heard descriptions of matrices in connection with nearly every kind of dental work, but, so far as I know, parts at least of this method are original with me; I have never seen it described before; but even if it be old—with apologies to you who may have been bored—if by its reiteration I succeed in affording to some of my *confrères* the satisfaction in its use that I have had, I shall be fully repaid for my efforts.

DISCUSSION.

DR. JAMES McMANUS, Hartford. I will say a few words on the question of amalgam, and I am rather glad to do so, because our president, in his paper this morning, read an advertisement of Dr. Clowes which was printed in the New London papers years ago. I had the pleasure of knowing Dr. Clowes for a number of years, and he was considered the best amalgam worker in New York, and that meant a great deal, although there have been probably as fine workers in the small towns as in New York, and of the good ones in the latter city many, like Dr. Clowes, had come from the country. New London was quite small when Dr. Clowes went to New York.

In that advertisement he speaks of his triumphant operations. I have seen a great number of amalgam fillings put in by Dr. Clowes, some almost infinitesimal in their size, others covering the entire tooth, and others where the teeth had been very much exposed to decay and were all filled, in a way that I had never seen until I saw his operations. There was a feature of his amalgam work which to me at the time was very amusing, viz, the way in which he would build up artificial teeth to improve occlusion after they had been worn for several years and the plate had settled in the tissues. He would with a wheel cut grooves in the porcelain teeth, and build amalgam

into these grooves until he had as perfect an articulation as one could desire. It was a queer use to which to put amalgam, but to my mind one of the most successful and, done as he did it, as good as anything. I do not know that it would be possible to do as good work with any other material we have today. I have great faith in the use of amalgam in many of the broken-down conditions that we meet with, and which the essayist demonstrated.

I had little experience in this line as a young man, because my preceptor never used amalgam. He never put an amalgam filling in a tooth in the eighteen years that I was in his office. He used nothing but gold and tin. At that early time we did not have Hill's stopping. He was a fine gold operator, and a fine operator with tin, but occasionally he would send a very bad case to Dr. Riggs, to be filled with amalgam, because, Dr. Riggs was known in those days as the finest amalgam worker in that section. And so, as I say, I never had any experience with amalgam until I had been in practice quite a number of years. I believe, however, that many teeth can be saved with this material in a much more favorable way than by grinding the teeth and crowning them, as many are doing today. I think the profession of the country have done an immense amount of damage to patients by foolishly grinding teeth and crowning them with gold, when with patience and care, and, in time, cultivated skill in the use of amalgam, they might have saved teeth and given their patients much more comfort, and caused less of nervous strain in having work done.

Dr. J. W. BEACH, Buffalo, N. Y. As Dr. McManus has said, there is no material which can be used to so good advantage for the salvation of badly broken-

down teeth as amalgam. I think it was the late Dr. Flagg who said that in proportion as teeth needed saving, gold was the poorest material to employ, and he might have continued, that amalgam was the best.

Dr. G. A. MAXFIELD, Holyoke, Mass. The essayist has brought out some very excellent ideas, but there are a few points I would like to criticize. I have never yet in my practice seen a tooth needing building up as badly as he has described, and having a living pulp. In all the cases that come to my hands as badly broken down as he describes, I always find the pulp dead. I know we may have very large cavities in molars and yet the teeth still have living pulps. If a great deal of restoration be needed, I think it a very unwise practice not to devitalize the pulp. The essayist says he has been practicing this system three years, and has not had trouble with any case. If he lives ten years longer, he will find these patients having trouble. Further, they will either have pulp-nodules in the teeth or the pulps will die and abscesses follow—most likely pulp-nodules, with the resultant neuralgia which the patient cannot place. I have had a great many cases of neuralgia of eight or ten years' standing—all arising from the capping of the pulps. If a patient has ever suffered from pain in a tooth having a live pulp, and that pulp is capped, it will in time become the seat of inflammatory conditions.

Now, I believe in saving a pulp where possible, because after its death the tooth becomes brittle, and under the stress of mastication there is more likely to be a breaking down of the structure. So I endeavor to save pulps where I can, but never if there has been pain through the near approach of caries to that pulp, for

I realize how severe the consequent neuralgia will be as a result of that capping. In some cases where the pulp is capped, the irritation will cause the pulp to recede in the cavity, and in that case the root-canal may be explored a considerable distance down the root before causing sensation; but these cases are rare. More often there is a deposit of calcium salts in the pulp itself, and consequent neuralgia.

Another thing in regard to the mixing of amalgam. In one of our recent journals—I think a western one—someone has given a very interesting series of experiments with alloys, and the conclusion of these experiments is that bad results come from amalgam because it is not properly amalgamated. I do not think you can properly amalgamate alloys unless you use an acid aqueous solution in the mixing. This point was given to me by the late Dr. Clapp of Boston, some seven or eight years ago, and I have since employed the following method: Take hydrochloric acid, one part, and twenty parts of water; place the mercury in the mortar and pour on a sufficient quantity of alloy; then cover that with the acid solution, and you will be astonished to find how quickly the alloy will amalgamate. At the same time the dross is removed, and perfectly clean amalgam will be the result. After amalgamating it thoroughly, wash it off in the mortar with clear water, and then, drying it on a napkin, you have a very clean alloy, and one that keeps bright in the mouth.

Another thing. In large amalgam fillings I think one should be as careful to polish them as one would a gold filling. I have some patients in whose mouths the polish has kept admirably for five

years. I remember Dr. Flagg's advocating the use of a smooth stick in the polishing of an amalgam filling, drawing the stick in the same direction all the time, and so making the lines in one direction, and leaving the filling in that condition.

Dr. A. J. FLANAGAN, Springfield, Mass. Someone has said that the critic is the fellow that cannot do it, so I will not criticize. First, I want to congratulate New London and the Connecticut Dental Society for having in the immediate vicinity a young man, recently come from college, who is imbued with the proper spirit of the college, and who has the proper society spirit.

Remember, I said that the critic is the fellow who cannot do it. I find, where I have practiced dentistry, that there is something in the atmosphere, in the material, or in the lack of knowledge on the part of Flanagan, that prevents me from saving pulps by capping—except with arsenic and then removing them. Now that is not criticism; it is simply a statement of experience.

Another thing. There is a man in the West named Hungerford. Some years ago, before the National Dental Association, he made the claim that where the pulp is liable to die later on, it is better to destroy that pulp and then remove it and fill the root-canals. And, gentlemen, why? Dr. Hungerford produced this scientific thought, and asked each one present, where they had pulpless teeth to treat, which were the cases that produced the most trouble in practice; and invariably they said, in the words of Dr. Flagg, "Those sleeping volcanoes that went along so many years after capping, and then all of a sudden there was an eruption almost equal to that of Vesuvius."

These are the ones that you have trouble with. At least I have, and I think others do.

Where is the trouble when one treats such a tooth? It is beyond the apex of the root, in the immediate vicinity of the former. Then it is a serious question to successfully fill and save these teeth, whereas if they had been devitalized in the beginning, and filled properly, we would have had, from the standpoint of science and clinical experience, better results. I do not think anyone can controvert that. I think Dr. Hungerford is right, and believe we must uphold that which science has produced.

Dr. Whitford spoke of the originality of the idea, I say it is original, because he did not know anything of the work of others along the same line. Even though you may go back, and see in the *International Journal* that Dr. S. E. Davenport of New York came to Springfield some years ago and showed this same method—and I think there were men before Dr. Davenport who practiced it—yet that does not detract from the value of Dr. Whitford's good work or his credit for producing what he has.

Dr. WHITFORD (closing the discussion). We can all learn something, and I am here to learn. There are several points upon which the best of us must be at variance, and I presume that the life and death of the pulp will always be in dispute among the members of the profession. I did not say in my paper that I capped every pulp, for I do not, but I think that there are cases when by capping an exposed pulp its life can be preserved. Of course we cannot look into the future very far, and see how long a tooth we have worked upon will live, how long it will take to die, and how

long it will remain in a decently dead state.

Dr. Maxfield was inclined to be pessimistic, but I am rather inclined to be optimistic. Of course I do not wish to take sides against Dr. Maxfield, with his long experience, but I have a tooth here now that has been filled for some time, and is today in a healthy condition, that under any other method would have been devitalized. I do not claim to cap every exposed nerve, and I said in my paper to be careful to test the tooth, and see what it is good for. Dr. Maxfield said that after a tooth has ached, that tooth is bound to die. Perhaps he is right. The first questions I ask my patient are—Has the tooth ever been sore; has it ached; is it sensitive to hot and cold water? Any one of these questions answered in a certain way will prove the advisability of certain procedures.

But when a person comes in with a tooth broken down, perhaps from erosion, so that the tooth looks badly, I would like to have you try this method. It is one from which I have never had any trouble, and the test given is one which I think will enable almost anyone to tell whether the tooth will remain alive or die. I would not be understood as capping every pulp that comes to me, but I devitalize teeth the same as does anyone else. There are many exponents of capping pulps who will keep under treatment, week after week, a tooth that has been aching, to see if the pain will cease, and if it does they cap it. Anyone would say that that tooth will die, and I agree with you there.

One of the speakers referred to the manner of mixing alloys. That, I think, does not enter into the subject of the paper proper. I do not recommend any

special manner of mixing alloys, but believe in every man doing it as he pleases, provided he uses a good amalgam and gets it dry before putting it into the cavity.

One gentleman spoke of the "sleeping volcano," which is a very apt illustration, but I have seen some devitalized teeth that acted like volcanoes.

Now, gentlemen, coming right down to the rock-bottom truth of the matter, how many here can take an upper molar with crooked canals, and get every particle of the pulp out? Those who can, say "aye." [No answer.] Of course this proves nothing—I am willing to admit that, but there are sleeping volcanoes in teeth after they are dead. If you can take a tooth and cover it with a gold cap with the pulp alive—and many do this—certainly you can perform the operation I describe, and the chances are that the results will be favorable. Just because a tooth looks dark and perhaps somewhat doubtful, I do not see that that is any reason why you should devitalize the pulp. As long as the tooth an-

swers the requirements of a perfectly calcified one, I think it is far better to keep it in that condition. I would not say pursue this method after a tooth is broken down, and the soft structure filled with septic matter, but we often find black teeth that are as strong as any other. Such a tooth as that I think can be filled, and filled alive.

I have a young lady patient here today in whose mouth I shall be glad to show a tooth that has been treated after this method, and I will say that it was not done with any idea of showing it at this meeting, but it illustrates the method of treatment; and the patient will tell you that it is no more sensitive than any other tooth she has.

I wish to thank the society for the courtesy shown me, and to thank the gentlemen who have taken part in the discussion of the paper.

The next order of business was the reading of a paper on "Burnished Gold Fillings," by Dr. G. M. GRISWOLD, Hartford. (See following page.)

BURNISHED GOLD FILLINGS.

By G. M. GRISWOLD, M.D.S., Hartford, Conn.

IN this age, when so many are actively engaged in searching for new means and methods to accomplish more and better work, in our profession as in all others, we should ask ourselves repeatedly, as we take up work in any branch of our specialty, Is there any better way or method of making this, or performing that? All of us are liable to fall into ruts, and if we find that by following certain methods good results have been accomplished, we hesitate to set them aside unless we be thoroughly convinced that others are better. While such an attitude may be advisable, nevertheless we should be on the alert for "a better way," and this especially applies to the younger men in the profession.

Many of us are so constituted that although we may listen to the truths that are presented to us over and over again, they will have little or perhaps no effect upon us. This was the case in regard to the cohesive gold filling. Twenty years ago we placed amalgam on soft cement, used as a cavity lining, with good results, which practice has been followed more or less ever since. We have likewise tried at repeated periods to place gold foil in the same way, but with results not equally as satisfactory.

We had the pleasure of listening to Dr. Head of Philadelphia at the meeting of our society held in 1905 (see *Cosmos*, vol. xlvii, page 1322) and his paper contained thoughts that have led some of us to action. Since then I have tried many ways of placing gold in a cavity lined with soft cement, and possibly some of the points I have gained and which have been of benefit to me, may prove of some interest to you. If they shall lead anyone who has not already done so to try the method, it will be a source of gratification to the writer, for he fully believes that the adhesive gold filling offers great advantages over the old method of inserting gold.

However, if the method be faulty or defective, we surely want to know it, and sincerely ask for a free discussion. Some of the points in favor of inserting a filling by this method are:

(1) We believe it to be a thoroughly tight filling, and one which better supports the walls of a cavity, in many cases lessening the need of "extension for prevention."

(2) It is a very firm filling, as it adheres to the walls as well as being retained mechanically.

(3) It is a very dense filling, as none but polished surfaces are used in condensing the gold.

(4) Its insertion is much easier for the patient, as the mallet is not necessary.

(5) It is much easier for the operator, as there is no chance for "rocking" and much less strain upon the eyes, as larger points can be used.

(6) It is a saver of time, although it requires thoroughness quite as much as does any other filling.

(7) It is more compatible with tooth-structure, causing less thermal irritation.

Before describing the technique of the method, let us state that in our opinion the secret of success lies wholly in the annealing of the gold and the proper application of the required degree of heat.

We do not give as much credit to the blued burnisher as do some, for although a burnisher nicely blued and highly polished by a skilful instrument-maker is used with a great deal of satisfaction, a highly polished instrument not blued will accomplish the same results. But an electric annealer is a necessity for the best results. Let us quote from a little pamphlet issued by the S. S. White Dental Mfg. Co. on "Moss Fibre" Gold which is to the point: "Under no circumstances should the careful operator anneal this or any other form of gold in an open flame. That open-flame annealing has been and is now largely used, and that good, permanent operations have been and may be made with gold prepared by this method, is undeniable; but nevertheless such a practice is wrong. It is well ascertained that this same method of annealing has been responsible for many failures. It is unnecessary at the present day to go into detail, and

show why the annealing of gold in an open flame is objectionable and unscientific; let it suffice that uniform annealing is practically impossible, and that a contaminated condition of the gold is liable to result."

Annealing upon a sheet of mica is much better than an open flame, but it is far from being equal to an electric annealer, as the gold is not continuously or evenly heated.

One of our best men—and one for whom the writer has great respect—stated that he "discarded the electric annealer because, when in use, if the annealer was jarred or shaken by accident or otherwise, so that the pieces would come in contact, they would adhere so tightly that they could hardly be separated and consequently caused much annoyance." It is true that if the pieces are in contact they will unite very firmly, but this only proves that the cohesive properties of the gold are brought out to a great degree, more so than by any other method tried, and we fully believe that our friend discarded the electric annealer for what is really its very best feature. The Custer annealer was the one chosen, as at the time of purchase it was recommended as the best. Others, however, may be just as good.

The method which follows of inserting an adhesive gold filling may not in many points, if any, depart from that given by others; however, we will give it in detail:

Prepare the cavity and its margins as your judgment may indicate, avoiding retaining pits and deep grooves made with an inverted cone bur. Make undercuts with round or oval burs, and as shallow as will be sufficient to retain the gold without the use of cement, experience having taught us not to depend wholly upon the adhesive property of the ce-

ment, although in many cases it would be sufficient. Select instruments with polished surfaces adapted to the size, shape, and location of the cavity. In starting the filling use as large a point as you conveniently can, and one adapted to the undercut of the cavity, for it will spread the gold more smoothly and there will be less of the "evening-up" process required later. Place the fiber gold on the annealer; cut or tear it in pieces of various sizes—none too large, however; place on the annealer also cylinders, if you wish to use them. Turn on the current and by the time the cement is mixed the gold will be thoroughly annealed. In selecting a cement for lining the cavity take one that is "sticky" when mixed sufficiently thin to flow quickly and smoothly over the floor and walls of the cavity. Out of quite a number tried, I have found Ames' quick-setting gray to be the most satisfactory. Mix the cement quickly but thoroughly, carrying it to the cavity before it really begins to set. A double-end bayonet-shaped amalgam instrument No. 2 of E. J. Ladmore's set is a good one for the majority of cavities, of course using the larger or smaller end according to the size of the particular cavity in hand. Do not use a steel spatula in mixing the cement, as it is very liable to leave a stain that will show through the enamel walls, especially if the walls be thin.

If you have succeeded in placing the cement quickly in the cavity, wait a few seconds until it begins to set; then carry the fiber gold to place, pressing it well into the groove, and if necessary holding it with a fine point while more pieces are packed, in order that the attachment to the cement may not be disturbed or broken until the floor

and walls of the cavity are well covered. Sometimes, after having covered the cavity with fiber gold, it is well to wait a few moments in order to allow the cement to harden thoroughly before continuing the filling, but usually the heat from the gold and burnisher hastens the setting sufficiently to prevent any delay.

After removing any overlapping cement, and making sure that the margins are free from it, the filling can be continued, using fiber gold or cylinders, or both. We have found it of advantage to use both, as the cohesive property of the fiber gold seems to be greater than that of the foil, and if for any reason the foil does not unite, by placing a piece of fiber gold cohesion will usually be re-established. After the first layer or two of fiber gold is inserted, cylinders or foil in any form are largely used, as they may be burnished to place more smoothly, and we believe more solidly, although in the "leveling up" process fiber gold spreads more readily, and is therefore of great advantage. We prefer foil, especially for the surface, but in many cases a few layers of rolled gold work beautifully and produce a fine surface. In placing the pieces of gold press them gently to place before burnishing. This prevents dragging and displacing the gold before the attachment is made. Burnish each piece. This is of the greatest importance, as a dense filling cannot be made if several pieces are placed and burnished together. Trim and polish in the usual way.

In closing, I would say that we have used the method described almost wholly for the last two years; in fact, we have had occasion to use the mallet but little in that length of time, and in many cases only to test the density of certain fillings

and to be more thoroughly convinced that we were producing a solid filling. We are realizing more and more the great relief it is to the patient to be freed from the blows of the mallet, and the consequent satisfaction to the operator. In the two years we have had opportunity to observe many of the fillings inserted

by this method, and are more and more convinced that it is "a better way."

As we depend so largely upon the cohesive properties of gold in this method of filling, and as we make an adhesive filling by the use of the cement, it is suggested that we term it the "Co-ad" method of filling.

DISCUSSION.

Dr. A. J. CUTTING, Southington. I have been using this method for quite a number of years, possibly eight or ten, which is much longer than the essayist claims to have used it, and I presume it was a knowledge of this fact that led the committee to place me on the program to discuss the paper. As I say, I cannot discuss it, but I will give some of my experience with this method. I wish to sanction all that the essayist has said, and while describing the method as I have practiced it I will incidentally emphasize, and perhaps more fully round out, some of the points that he has made in his paper.

For instance, with regard to cavity preparation: I would not go into the detail of cavity preparation, but I wish to emphasize the fact that we must be very careful not to have too sharp angles where they can be avoided. If you wish, have every corner round. If a cavity must have sharp angles, by filling in with the cement you fill in the angles, and it does not make so much difference; but my practice is not to have a large amount of cement unless I want to avoid the ef-

fect of thermal changes. I do not think the practice of using a thin layer of cement as lining for our cavities is sufficient to make much difference with the thermal changes. If I have a shallow cavity in an extremely sensitive tooth, where I do not feel warranted in putting the patient to the pain necessary to make much retention, I trust a good deal to the great adhesiveness of the cement. I use the cement thinner than for a deep cavity, where the shape of the cavity is such as to hold the filling, on the principle that the least thickness of an adhesive cement is stronger than a body of cement. This is the same principle as is applied by the carpenter in gluing furniture—he does not use a bulk of glue, but as thin a coat as he can get, with a very close joint. If you do the same with any of the adhesive cements—such as the inlay cements—and let them properly set, you will have an adhesion there that will hold the filling. But if you have a deep cavity and want the benefit of a body of cement, then use it thick, partially filling in the cavity and gently pressing into it a layer of gold,

letting the cement harden before you burnish the gold. One of the stumbling-blocks in this method is that you are likely to be deceived by the unconscious tipping of the filling when you start to burnish. When this happens you will find that later the filling will loosen and come out.

The essayist has said that he does not care for the blued instrument. I do, because I do not have to stop to polish the instrument. I started to use this method by employing the highly polished unblued instrument, but the only objection to it is that the instrument will soon become coated with the gold, and one must continually stop and polish the instrument. But if you use the blued instrument, the gold, as long as the blue is there, will not stick to it; and if you find a tendency to drag your gold with the instrument, you need only hold it in the flame a moment to re-blue it, which will stop that tendency, unless it becomes coated with gold, when it must be polished and re-blued. The essayist tells us to put in the gold and pack it to place with a little pressure before burnishing. I burnish from the first. I have never used the electric annealer. I pick the gold from the tray with the burnisher and pass it through the flame, heating it to a cherry red, put it to the filling, and if the latter be properly condensed it will almost jump to place. There is one thing I try to avoid, and that is not to catch any air under the gold. Perhaps you have never had that happen, but after you attach your gold, and lap it over and over, sometimes you will have in the finished filling little pits, and this I attribute to air getting under the gold.

With regard to the style of instruments to use, I would say use any instru-

ment with which you can reach all parts of the cavity, and burnish from the center, bringing the filling along the walls in such a way that you have ultimately a saucer shape as you approach the outer surfaces of your filling. One of the things that annoyed me most when I commenced this work was the fact that occasionally after I had gotten a filling nicely finished, in a short time the patient would come back, and I would find the gold flaking off at the outer margins. After testing and trying fillings of this character, I came to the conclusion that I had not properly condensed the filling next to the enamel wall of the tooth, so now I am particular as I approach the enamel surfaces to so condense with my burnisher as to be sure that the surfaces of the filling all around the margin of the cavity are as solid as I can make them, and when I have done that I do not have any flaking. I use right and left flat burnishers of greater or lesser size for most of my work, and am very careful that no air is caught within the layers of gold.

In starting the filling with cement lining one may use any form of gold, but I prefer the fiber gold, as small particles of the gold will enter the cement and make a more perfect union between the gold and the cement.

This is a practical subject, and one that I am surprised to see so many hesitating about adopting.

One of the questions I am often asked when I am giving a clinic is, Does it save time? Well, that depends upon the operator. It is much easier for the patient than for the operator. If you are going to take the method up with the idea that it is easier to do, you will find that you are mistaken—I have not found it so. My wrist aches many times when

I have finished a filling, but the patient will often be sleeping soundly. It is hard work when we use finger-strength sufficient to give a thorough burnished condition to gold. But I say, it is much easier on your patient. You may be able to save time if you are quick enough, or you may not, but when you get through with a filling after properly applying this method you have a solid gold filling, and you have done good work for your patient.

Dr. E. H. MUNGER, Hartford. I am a decided convert to this method. I have been using it nearly as long as Dr. Cutting and thoroughly believe in it. All of us have had nervous patients complain of the use of the mallet in gold work, and I believe that as dentists it is our duty to relieve the patient as much as possible from avoidable distress and annoyance.

Dr. Griswold says the method is easy. In some cases it certainly is, and in others I agree with Dr. Cutting. A few days ago, when I built out a large corner of a tooth, my wrist ached when I finished the filling, but the patient was in a better condition than if I had used the mallet, and had as good a filling. Certainly you can with care make a very dense filling, and I believe that you can take a tooth that is soft and weak—too much so to bear the use of the mallet—and insert a gold filling by this method. I remember, during the days when I first used this method, one patient—a Swedish girl with characteristic soft teeth—in whose mouth I had put a number of large fillings, and I was anxious to see the patient again to note the results. About fifteen months after that I saw the patient again, and I was happy to see the results. These fillings were as perfect as when the girl left my office

after the work was done, and I do not believe, in fact I know, that I could not have placed gold fillings in her mouth, using the mallet, and have them come back in the condition that they were in. As I say, I am a thorough convert to this method. I use the electric annealer. I have one or two blued instruments that I do not depend upon. Undoubtedly, if you do not use the electric annealer, you need to use the blued instruments, but if you have the electric annealer, the blued instruments I think are not necessary.

Dr. L. C. TAYLOR, Hartford. I know many men who are using this method as they have used many others, trying to pack gold against walls where there is no affinity. But men today who are packing gold against teeth, and trying to save them in that way, cannot be called anything but back numbers, even though they are in the majority, because there are so many men who are teaching a better way; and I am glad to know that our friend here is standing up for the right, even though he says he has been using this method for only two or three years. I have been using the method for eight or ten years, not only for burnishing the gold, but for malleting it.

I must take exception to the burnishing process, when it comes to a large corner of a tooth. In places where there is considerable leverage afforded, I do not believe you can make a gold filling as strong with the burnishing process as with the mallet. I believe, however, for ordinary work, you can make a better filling by burnishing than is possible with the mallet. You hear so many men speak of the fear of getting a little of the cement on the marginal edges of the cavity. It is true that this is liable to happen, but supposing it does! Turn

right around and ask any man who is doing porcelain work, and he will tell you that he has this line of cement in every porcelain inlay. With the exception of the objection to its color, there is today no method of filling teeth which is as good as the practice of building them up with gold, and particularly over this cement medium, which preserves the tooth-substance. To attempt to save teeth with gold today I consider poor practice, because methods of using cohesive gold now are far superior to the old way of trying to pound gold upon the tooth-structure, which would result in a filling around which the tooth would turn blue in a short time. In many cases there is every appearance of perfect walls, yet the tooth is turning blue, which is proof positive that that filling is leaking—and when a gold filling is leaking, although it may be a slow process, it is going back on us.

Now as to the question of whether it will last as long as some of the gold fillings that we have seen last for thirty or forty years—fillings made in teeth that did not need preservation, which accounts for their having lasted forty years—whether it will last that length of time I do not know, and I do not care, because even if it does fail in five years, I can say that if you have your lining right, you will then find the tooth in a splendid state of preservation, and it is a very easy matter to insert a new filling. But with the wide line of decay which comes from improperly pounding gold into soft teeth that never should have been filled that way, it is an entirely different matter.

I am a believer in this method; it is a true step forward. Many are talking theories, but, going back to first principles, modern and oral hygiene and the

hygienic fillings are doing more for tooth-preservation than all the other theories put together.

Dr. HUGH DRYHURST, Hartford. I have been waiting for someone to say something of the failures with this method. I cannot entirely approve of it, because in the last few weeks—since I have had notice of this discussion—I am sorry to say that I have come in contact with fillings inserted after this method where the palatal walls of the cavities have been broken away, whether by too hard pressure in the burnishing of the gold, or whether the enamel margins were cracked in the packing process, I do not know. On the labial side of these fillings I have also noted that the gold has cleaved away, more so than in any filling that I ever saw in my own practice of fifteen years' experience; consequently I think we have failures in that line as well as with the old method of using the mallet. Not that I advocate wholly the method of malleting, but I think a filling inserted in that way is just as dense, just as firm, and just as solid, as the one that is burnished in.

I would like to ask what is the cause of that breaking away? Dr. Cutting says one trouble is in getting air under the gold. That I think is probably the cause of the gold flaking off, but I would like to ask what would be the explanation of the breaking off of the enamel margins? I do not think that we as dentists should desert the old methods for new ones until we find that the latter are doing superior work.

Dr. GRISWOLD (closing the discussion). I prize very highly the remarks of Dr. Cutting, because he has had long experience with this method, and I think this testimony is worth a great deal to all of us. Personally, I have had but two

years' experience with it, but am satisfied that it is good. I have had twenty-eight years' experience in packing gold, and believe I know when a gold filling is well condensed, and for that reason I am a convert to this method. With regard to Dr. Dryhurst's remarks, I wish he would try this method for his own satisfaction. If anyone does not believe

in it, let him try it. The proof of the pudding is in the eating—try it.

The President announced as the next order of business the reading of a paper on "Hygiene Maintained During the Progress of Orthodontia," by Dr. H. C. FERRIS, Brooklyn, N. Y. (See following page.)

HYGIENE MAINTAINED DURING THE PROGRESS OF ORTHODONTIA.

By H. CLAY FERRIS, D.D.S., Brooklyn, N. Y.

THE maintenance of hygiene of the oral cavity during the operation of regulating teeth is a problem that annoys the orthodontist, the usual method of cleansing the mouth by the vigorous use of the tooth-brush and powder being impracticable, as it frequently pulls the wires off and thereby interferes with the operation.

Our field of operation is one of low vitality, owing to perverted nature; nasal obstruction is present in a large percentage of the cases, rendering mouth-breathing a necessity and producing an abnormal development of the mucous tissue of the oral cavity and air-passages. The antiseptic qualities of the nasal mucoid secretions having been lost, the air passes through the mouth and enters the lungs laden with bacteria, owing to this abnormal action. The hypertrophy of the faucial and pharyngeal tonsils, usually present in cases of orthodontia, renders them more susceptible to the attacks of pathogenic bacteria.

The physical condition of these patients, owing to this abnormal functioning, renders their systems less able to resist attacks of bacteria such as the *diplococcus pneumoniae*, *bacillus diphtheriae*, etc. The accumulation of car-

bohydrates and proteid substances clinging to the metallic appliances, both stationary and removable, forms the best food for the nourishment of oral bacteria; and these mucoid plaques are removed with difficulty, even by the most careful mechanical means. As in most mouths fermentation occurs after each meal, even in the absence of such appliances, in the event of their presence and on account of their accumulating tendencies the fermentative action is proportionately increased. The fermentation of carbohydrates results in the production of certain acids, among which lactic acid is the most important.

The decomposition of albuminoids results in the production of alkaline end-products. When the two are mixed with the products of fermentation they produce a mild acid reaction, which depends partly on the particular form of bacteria acting upon the mass and partly on the nature of the food and the percentage of its carbohydrate contents. According to the percentage of excess of lactic acid formed during the fermentative action of certain bacteria on the carbohydrates in the mouth, we find the pathological conditions of the mucous

surfaces increased, as a hyperacid condition of the oral secretions proves to be one of the irritating causes of disease of these tissues by lowering their functional activity, and thereby rendering them more vulnerable to any form of micro-organism.

Can we afford, in our effort to assist nature to establish a normal occlusion, to neglect hygienic precautions during an orthodontic treatment which places in the oral cavity materials which facilitate the accumulation and growth of these organisms, without endeavoring, with the assistance of the means at our command, to inhibit their reproduction? From bacteriological experiments we learn of the rapid growth of these bacteria in the oral cavity, and we find by clinical experience that the teeth and appliances are rapidly covered with oleaginous substances which become a favorable medium for their development.

The antiseptic qualities of the copper used in some orthodontic appliances we appreciate, but we know that the colloidal copper which exercises this antiseptic action is given off only while the metal is polished and free from albuminoid deposits. Consequently, when wires containing this metal are not submerged under the gum tissue, the antiseptic action is soon lost, and therefore we must look to other means for cleansing these surfaces.

Again, in the adjustment of wire ligatures, even in the most skilful hands, the operator is apt to puncture the mucous tissue, and as it may be assumed that these wires are—bacteriologically speaking—unclean, we are liable to infect the susceptible subject. We have but few such cases on record, one of which—reported by Dr. J. W. Russell to the Second District Dental Society of the State

of New York—was of tuberculosis in its most virulent form, acquired through the use of a septic dental scaler, and which resulted in the death of the patient. The difficulty of tracing these infections to the hands of the dentist is the reason for the few reports of this character. Simple methods in technique can to a large extent control such infections.

If, on the contrary, we find that the wire furnished us by the dental supply houses is sterile, it is liable to become infected by handling. The wire put on the market by Dr. Edward H. Angle will frequently give negative bacteriological results.

A bouillon tube was infected by a wire of this make and kept in an incubator in Seney Hospital under the care of Dr. Dexter, pathologist of the institution. Another tube, containing some of the same bouillon infected with serum from a septic wound, was introduced into the incubator at the same time as the former, and developed a culture in half the time. This single experiment does not prove that these wires are invariably sterile when they reach our hands, and as the method of sterilizing them is so simple, we should certainly assume no risk of subsequent infection.

By introducing a bundle of wires into a glass tube properly corked, we may sterilize the contents by boiling for twenty minutes in a saturated solution of sodium carbonate and allowing them to remain in the solution. They may also be sterilized by exposing them to the action of formaldehyd gas for eight hours; or by allowing them to remain in a colloidal copper solution for one hour; or by subjecting them to dry heat. By using any one of these methods we may be reasonably sure of having a sterile product. Each method has its advan-

tages and disadvantages. The preference should be given to that of dry heat or formalin, as these do not tend to oxidize the appliances.

Our field of operation' is the most septic of any in the body; therefore the first step in the technique should be to render it aseptic so far as is possible. We first, as thoroughly as possible, mechanically cleanse the teeth with a frictional material, and then spray the parts with antiseptic solutions under high pressure, in order to destroy the bacteria present. We have numerous antiseptic agents of varying value, from which we may select one sufficiently powerful to meet the case. The most cleanly patients naturally present the most healthy tissues; but their susceptibility to infection, owing to their general systemic condition, must be taken into consideration.

To prove the necessity for antiseptic treatment, a wire that had been worn three weeks was taken from a mouth which had received no prophylactic care. It was gently scraped with a sterile platinum loop, with which a bouillon culture tube was inoculated, the wire itself being placed in another bouillon tube. The latter developed no culture, thereby proving the antiseptic qualities of its composition, as the surface was enabled to give off colloidal copper. In the former, a microscopical slide showed the presence of bacilli, diplococci, and micrococci.

There are solutions that are largely alkaline and pleasant to the taste, with little antiseptic value; but the patient's sense of taste must not be considered to his detriment. The solutions which are sufficiently strong are not particularly pleasant, although this may partially be controlled with flavoring materials. There are two drugs, accepted by author-

ities, which we may employ. The first may be used on mild conditions, and consists of the following:

R—Trieresol,	℥ xxx;	
Aquæ cinnamomi,	℥ iv.	M.

Sig.—To be used in spray at the temperature of 115° F.

The active principle of this solution is the tricresol, the oil of cinnamon being used to disguise the disagreeable taste. The former is a clear, white, watery liquid, having three times the disinfecting value of carbolic acid, and being three times less poisonous and less caustic. It is composed of ortho-cresol thirty-five per cent., meta-cresol forty per cent., and para-cresol twenty-five per cent. In bacteriological experiments undertaken by Major Walter Reed, curator of the Army Medical Museum in Washington, it was found that a one per cent. solution of it accomplished as much as a four or five per cent. solution of carbolic acid. It is particularly valuable for our purpose, as it is active in fluids rich in albumin; and being of neutral reaction, leaves the metallic surfaces bright. It is also readily soluble in aqueous solutions.

In acute conditions, when we require a stronger antiseptic, we may use the following solution:

R—Iodin,	℥ xix;	
Potassii iodidi,	℥ xix;	
Aquæ destillatæ ad q. s.	℥ iv.	M.

Sig.—To be used in spray under high pressure at the temperature of 98° F.

The antiseptic value of iodine has been recognized for centuries, but the value of any antiseptic is in proportion to the strength in which it can be used. This agent, in its powdered form, as iodoform and aristol, is a standard in our hospitals. It has a quality which mercury bichlorid

does not possess—that of producing the destruction of the capsule of a spore. It has been recently found that the solution of this drug becomes more potent when potassium iodid is combined with it, the latter agent increasing its solubility. The U. S. P. published in 1906 directs the addition of potassium iodid to all tinctures of this drug. The solution here recommended, when sprayed in the oral cavity, will fix and stain the plaques of bacteria so that they may be detected both upon the surfaces of the teeth and on the appliances. In order to remove these plaques use the following mixture:

R—Starch,	gr. xxxvii j;
Aquæ menth. pip.,	ʒ iv;
Oil peppermint,	℥ xx.

Mix the first two ingredients and let stand for five minutes, then boil five minutes, and then add the flavoring.

This will convert the iodine into an iodid of starch, which is an insoluble compound which tends to cut mucoid substances, and when washed off in flocculent precipitate from the surfaces of the teeth and appliances, carries with it the proteid substances.

To decolorize the stain thus formed and wash off the precipitate employ the following solution:

R—Sodii carb.,	gr. xxxvii j;
Aquæ gaultheriæ,	ʒ iv.
Olei gaultheriæ,	℥ xxx. M.

Sig.—To be used at the temperature of 115° F.

Chemically we have this reaction:

$$KI + 6I + 3Na_2CO_3 = KI + NaIO_3 + 5NaI + 3CO_2$$
, starch appearing on both sides of the equation, and not entering into the chemical reaction. The first two solutions, the iodine and the starch, are united to form an iodid of starch, leaving the potassium iodid free; and as

we find potassium present in our normal saliva, we assist nature by this means to dissolve the excess of mucin. After a treatment as here outlined we may be reasonably sure that we are working on a sterile tissue, and that the liability to infection in our patients is reduced to a minimum.

The hands should be sterilized by brushing with a sterile brush and green soap, subsequently immersing them in an antiseptic solution—preferably three per cent. camphenol—which should be placed in a bowl within reach of the operator, in order that he may free his hands of mucus during the work. The boiling of pliers, scissors, and carriers during the intervals between their use on patients is a precaution that no intelligent operator can neglect. Instruments such as lancets, scalpels, broaches, etc., may be placed in glass tubes and boiled for twenty minutes in a saturated solution of sodium carbonate, and placed in the cabinet ready for use at any time.

The prophylactic treatment at each visit, once a week, requires but ten minutes, and the results are remarkably satisfactory. The patient is directed to be particularly careful in cleansing the mouth, and is given a solution as follows:

R—Hydronaphthol,	
Menthol,	āā gr. xxx;
Olei gaultheriæ,	
Olei cassiæ,	āā ℥ iv;
Spts. vini rect.,	ʒ x;
Tinct. capsici,	ʒ j;
Aquæ destillatæ ad q. s.	ʒ xx. M.

Sig.—Teaspoonful in a half-glass of hot water.

This is to be used twice daily, morning and night, and in acute conditions five times daily, holding the solution in the mouth for three minutes. A mouth thus cared for will show little, if any, inflam-

mation even in the presence of irritation, and the operator may feel that he has done all in his power to protect his patient. A ligature wire which had been worn in the mouth for one week under this prophylactic treatment was placed in the incubator, and at the end of three days developed a negative result. While

single experiments do not scientifically prove an hypothesis, your essayist offers this practice for your consideration.

I am indebted to Drs. T. H. Dexter, G. E. Hunt, T. W. Brophy, A. W. Harlan, and to Mr. H. L. Quick, Jr., for many of the facts used in the preparation of the paper.

DISCUSSION.

DR. E. S. GAYLORD, New Haven. As the essayist has given us the scientific reasons for the necessity of hygiene in the course of regulating operations, it would remain for me to say but a word in reference to the practical application of his suggestions. That phase of the subject comes within the realm of that with which I am somewhat familiar, and I am very glad to stand before you and assert that I know of no means in dental practice that is so conducive to great results as is prophylaxis—and when I say prophylaxis I mean all that is implied in the word, and not half-way treatment. The great trouble with operators in the first place is the fact that they are too busy to practice prophylaxis, consequently it is not carried out in the thorough and conscientious manner in which it should be done. To the contrary it is done in a kind of haphazard way—mostly with the aid of the engine. While I do not mean to say that good results cannot be obtained by the employment of the engine, I do say that the best results cannot be obtained by its exclusive use. Now, if we will take the position that

our time and our skill are of some value, and impress our patients with that fact, we will then treat our cases in the manner which shall be creditable to us, because we will give our time for the proper remuneration. And there lies the reason why our services in this connection are rendered in a haphazard manner—too hastily altogether, and consequently imperfectly done. But notwithstanding the imperfections of work done by the busy practitioner, if you were to see your patients one week from the time at which you operated with the engine, and realize the good results obtained by that practice, then I am sure you would agree with me that it is worth while to go still farther, and endeavor to cleanse every surface of every tooth. Your patients, after they have become acquainted with the benefits of this work, will insist on having the prophylactic treatment continued.

Now, along that line, I would like to give a little of my experience in the treatment of children. It is but a few years since the fact of a child coming into the dentist's hands was to it a source of

dread. Today, in the practice of prophylaxis simply and thoroughly, it is a source of pleasure after he becomes interested. He realizes that he is not having teeth filled, and enjoys the treatment. If you start with a child and imbue his mind with that principle, imagine the condition of that child in later life, with the teeth in perfect condition, with few cavities, and I may say almost none, because I do believe, gentlemen, that mouths can be kept absolutely free from caries by the thorough cleansing of the teeth, save for imperfections in the enamel.

I want to say a word to the young men, and I am done. The impression has gone abroad that it is not worth while for the young man to devote his time—sufficient time—to the cleansing of his patients' teeth, consequently such work is being done in a haphazard manner. Now I want to say this, and I hope Dr. Ferris will express himself a little more clearly with regard to his methods of applying the dental formulæ which he presented. I apprehend that he is doing it largely with the spray. This, I think, is one of the most important features in the practice of prophylaxis; it is one of the most valuable, and becomes one of the most pleasing to our patients. I want to say to the young men first, Do your duty. If you find yourself unable to purchase the outfit as presented by our manufacturers, then create one of your own. Go to your plumber and get a boiler; then go to your bicycle dealer and get a pump. But, you say, I have not the time to pump air into a boiler. Well, if it is not within your means to purchase the machinery for this, pump it in with your hand, and you will be a better man for it; it will develop your muscle as well as your appetite, and you will live longer, because you obtain good exercise, and will place yourself in

a position to treat your patients in a most satisfactory and useful manner both to them and to yourself—not only satisfactory, but productive of the greatest good.

I might talk almost indefinitely on the subject of prophylaxis, because I feel very much imbued with the spirit of its usefulness, still I do not wish to divert the discussion from the original subject. As I said before I am not an orthodontist, and I must naturally digress from the subject, but if what I have said will be the means of starting the ball to rolling, I shall be very glad indeed to have had the pleasure of talking on the paper.

Dr. R. H. W. STRANG, Bridgeport. I appreciate greatly the importance of the subject before us this afternoon. It has afforded me great pleasure to listen to a paper in which the subject-matter is not purely theoretical, but in which facts are presented to us, and the proof thereof. Dr. Ferris, by the assistance of the bacteriologist, has been able to prove that his formulæ are effective, and a few of us have also been able to demonstrate it clinically. There are many reasons why we as orthodontists should appreciate the importance of prophylaxis. We are dealing with children mostly, and as you all know, children and tooth-brushes are not great friends. They will neglect their teeth even when there are no appliances on them, and certainly, when the latter are present, they not only neglect these organs, but it becomes quite impossible to cleanse them, and the ligatures, bands, and arches are bound to gather food material which, unless removed, promotes the production of lactic acid, which is so destructive to the tooth-structure. Dr. Ferris mentioned the fact that we are working on patients poor in health, and as Dr. Kirk so strongly expresses it, lessened vital resistance is the primal factor

in the detrimental work due to bacteria. Most of the children that we treat are, as has been said, troubled with enlarged tonsils, hypertrophied lymphoid growths, and adenoids, and bacteria multiply very rapidly in the recesses which this hypertrophied tissue affords. When we realize that a bacterium becomes a grandfather and a great-grandfather in a little over two or three minutes, we can perhaps see how quickly myriads of these bacteria are produced to do their detrimental work.

The use of the compressed air in forcing these sprays against the teeth and soft tissues is very important to us as orthodontists. In fact it is practically impossible to clean the mouth without the assistance of compressed air. Each time I see my little patients I use the stick and pumice and clean all around the bands as best I can; and then trust to the compressed air to remove the remaining débris, using an antiseptic formula in connection with the spray. I think we should emphasize greatly the necessity for the patient to use a mouth-wash after each meal. We cannot see our patients more than twice a week, and consequently there is plenty of opportunity for fermentation to occur between their visits, unless they use a mouth-wash regularly.

I think there is a great field for investigation along these lines, with promise of success. Again I would congratulate the essayist upon presenting to us facts, and not theories.

Dr. F. B. NOYES, Chicago, Ill. I am glad to have listened to the reading of the paper. It was a very interesting one to me, on a subject which I think has been very badly neglected. Every practitioner who has had any opportunity of seeing cases in the process of treatment

has seen more or less damage done by the neglect to carry out proper prophylactic measures in cases of orthodontia. With the appliances in position our difficulties are enormously increased, as the essayist pointed out. It seems to me that the plans offered are practical and thorough. I would, however, desire a better plan for the patient to carry out the preventive treatment in the periods at home between visits to the office. I think the most effective method that the patient can employ is probably some form of syringe, by means of which he may keep the apparatus as clean as possible, using in addition the means suggested in the paper. On account of the ligatures and wires there must be proper antiseptic precautions where the metals come in contact with the soft tissues. You may say that there is small chance of danger in that direction, but it is our duty as dentists to preclude even such a minor possibility of caries-production.

Dr. GEO. T. BAKER, Boston, Mass. I wish to congratulate the essayist upon the paper which he has presented. It is certainly a subject which can be discussed by all with pleasure and profit. The subject of oral hygiene seems to be coming to the fore more and more, and this last winter, as perhaps some of you know, there has been an alliance between the societies of Boston and New York, and one result of their combined efforts will be the sending out of pamphlets and circulars to the different schools, calling attention to the importance of this subject; not especially in regard to orthodontia, but from the standpoint of dental hygiene in general.

Although the different methods described by the essayist are all very excellent, there is one other way by which we can maintain oral hygiene during the

course of treatment of irregularities, and that is by the insertion of properly constructed appliances. I have not one word to say against the expansion arch with ligatures, because it is a very efficient appliance, and one which we must sometimes use, but there are the removable appliances retained by the removable spring clasp with which we should all be familiar. I was speaking of them the other day to a professor in one of the colleges in our city, and he said he had never heard of the removable spring clasp. Now, if a teacher can make such a statement, it is possible that some of the general practitioners here have not heard of it, and when the committee invited me to come and give a clinic before the society, I chose that subject, and hope my demonstration tomorrow will show some of the advantages of those appliances in the practice of orthodontia. They enable the patient to remove the appliance and brush the teeth, and the operator to remove the appliance and clean the mouth and the appliances as well.

I wish once more to thank the essayist for introducing the subject.

Dr. O. T. RULE, Meriden. I would like to ask the essayist if all of the five different drugs that he uses in one of his prescriptions are necessary? Or why he uses five different drugs, some of which have, it seems to me, the same properties?

Dr. I. B. STILSON, Stamford. The one thing from which I have derived more comfort than from anything else in this work is the use of compressed air. Dr. Gaylord said we should all have such an outfit. We cannot all have the best, but anyone can get a tank and pump air into it, and it is a source of great comfort in the practice of prophylaxis in connection with operations for regulating teeth.

One of my little patients stops in every morning to have her mouth sprayed. She says she cannot do without it. In the afternoon on her way from school she stops in again to have her mouth sprayed. In this way I think we can keep the mouth in a better condition than by any other means.

Dr. FERRIS (closing the discussion). I appreciate very much the kind remarks in reference to the paper as a whole. There is one thing I would like to set straight, and which I particularly emphasized in my paper—and that is, that I do not object to mechanical means of cleansing the mouth. But after we have done our best with the engine or with wood points in Dr. Smith's holders, we still have material clinging to the wires attached to the teeth; these wires must be cleansed, and this cannot be accomplished by mechanical means. If we use, as Dr. Baker suggests, the removable appliances, we can sterilize them; but that brings up the question of the comparative value of the two methods, and it would be too long a story to enter into a discussion of that subject.

There is one point, however, of which I may speak, with regard to the removable appliances. Now, you direct your patients to boil them in water once a day. They are set on to boil and are forgotten; the water evaporates and your appliances are found in one mass at the bottom of the pan. All your efforts are lost, which is very exasperating and disastrous. Before you can make another appliance, you are apt to lose a couple of weeks' work. That is the greatest annoyance I had in the use of one of the best-known removable appliances.

The remarks of Dr. Strang I appreciated very much indeed, because he has been using this method, and it is pleasing

to hear the report of someone who has tried one's method of practice and found it valuable, even if you think you have it perfect in your own hands. Children's mouths require the greatest amount of attention from the prophylactic standpoint during the course of regulation, and in these cases it appears to be most practical.

In the use of my preparations I think the iodine solution is of all the most unpleasant ingredient in taste, and I play with my little patients in the use of it to take their minds off its taste. I assume the rôle of a magician, and say, "I will take this brown solution and spray into your mouth, and then you will expectorate ink." I follow the brown solution with the starchy one, and immediately they will expectorate ink. This is followed by sodium carbonate solution, with the information that the ink must disappear, together with the disagreeable taste. The ink disappears together with the disagreeable taste, and the child is pacified and the mouth sterilized. However, before I use these solutions, I remove every particle of debris that I possibly can by mechanical means. The solution of iodine has a more disagreeable

taste to children than to older people, but they do not dislike it half as much as you may imagine, and it induces a healthy condition of the gums and is not irritating.

Dr. Noyes mentions the use of the syringe. That, I think, is a very practical addition to my method of work, and one that I will adopt. I have never used the syringe with the children, but think a child would be glad to play with the syringe, and its use would be valuable, provided he did not pull the wires off.

In answer to Dr. Rule's question in reference to the complex combination, I would say that the hydronaphthol is used for its antiseptic properties; the menthol is used for its antiseptic properties, and also for the property of lowering the temperature of the mouth through evaporation. The two oils are used simply to cover the taste of the hydronaphthol, the alcohol to dissolve the ingredients, and the tincture of capsicum to stimulate the circulation of the tissues by counter-irritation.

Motion was then made and carried to adjourn until the evening session at 8 o'clock.

TUESDAY—Evening Session.

The evening session was called to order by the president, Dr. Crosby, who introduced as the speaker of the evening Dr. F. B. NOYES of Chicago, who gave a lecture on "The Structure of the Enamel

with reference to Cavity Preparation," with lantern-slide illustrations.

The association then adjourned to the banquet hall, where a collation was served to the members and guests of the society.

WEDNESDAY—Morning Session.

The Wednesday morning session was called to order by the President at 10 o'clock.

announced by the President was one by Dr. A. J. FLANAGAN, of Springfield, Mass., entitled "And They Say 'Comparisons are Odious.'" (See following pages.)

The next paper on the program as

AND THEY SAY "COMPARISONS ARE ODIOUS."

By A. J. FLANAGAN, D.D.S., Springfield, Mass.

IN the first place, gentlemen, I wish to correct an error in the printed program. The title of my paper should have been, "And They Say 'Comparisons are Odious.'" Perhaps after I have finished many will recognize conditions, be they fair or false, as I individually have recognized them for some years, and again there may be some here present who will in their kindness go out and say that Flanagan has a new disease—"dementia dentalis."

The good Book says, "The poor ye have always with you." It is my thought that had a second "good book" come forth in the last ten years, it would have contained the following: The pessimist we have always with us. The greatest thief in the dental world today is pessimism. He has been pursued for years by intelligent and reasoning practitioners, captured, convicted, and even confined, but only long enough to devise some way of escape—for he is still at large among us. Some few weeks ago I met one on parole. After exchanging greetings, I said: "How do you like this weather?" "Not much; I'm feared it's goin' to rain." "Well, how's times with you?" "Sorter so-so, but they won't last." "Folks all

well?" "Yes; but the measles is in the neighborhood."

How dreary this world would be if we all thought alike; indeed, life is only made interesting because of a difference of opinion. Opinion may be criticism. All criticism can be of two kinds—constructive and destructive. The destructive criticism rampant in our calling at present is owned and controlled almost wholly by the pessimist. Says little Johnnie to his papa, who is reading a monthly magazine, "What is a critic, papa?" The question is repeated three times before papa is able to bring his complex comminuted thinking back to his son by his side, for he has been reading "The Pessimist" in the *Items of Interest*. Papa suddenly kicks the cat purring at his feet, looks at Johnnie over the top of his eye-glasses, and says, "A critic, my son? Why, a critic is a fellow that can't do it."

For some years I have listened with patience—or rather endurance—to many of the unfair and illogical statements made by these representatives of the destructive in dentistry. In the short time at my disposal I intend to treat of certain particular instances where the

pessimism of the last decade in dentistry is as common as it is world-wide, and yet—to my knowledge—it has never been refuted successfully by a study and analysis of the statements made by these seemingly intelligent practitioners of dentistry. I refer to that everlasting comparison of dentistry to medicine. Were I to generalize this morning my argument would be like the Mother Hubbard wrapper worn by some members of the fair sex—while it seemed to cover everything, yet it touched nothing in particular.

I would now like to speak of the founding of dentistry as a profession. Perhaps there are many, both of the older and the young men present today, who may not know why dentistry of itself became a distinct calling. In 1839 Dr. Chapin A. Harris and that other famous man, Dr. Horace Hayden—to whose memory, be it said to the credit of Connecticut dentists, you are about to erect a memorial at Windsor, Conn.—were regular members of the medical profession, of good standing in the community, but practicing dentistry under the title of the medical degree. These two men tried to establish a chair of dentistry in the medical college at Baltimore; after refusal there they tried in other medical colleges, but did not succeed. To politely sum up the results of their efforts, they were kicked out. The medical colleges would have nothing to do with dentistry. Now I want you to bear in mind today one thing, and that is, that dentistry is not of medicine because medicine would not have it.

We are attending a dental convention and Dr. A. is lauding the superior conditions in medicine relative to medical education in general. The *Journal of the American Medical Association* of

August 25, 1906, is decidedly interesting reading, for it is the so-called “educational number.” There are about 156 colleges teaching medicine in the United States. There is a college in Alabama which claims four separate sessions. Investigation proved each session to be six months. A college in California has extended its session this year from six to eight months. They—the faculty—are the examiners for preliminary requirements. A college in Colorado advertises good clinical material; population of the town six thousand one hundred and fifty—one hospital with forty beds. Quite a prominent university medical department—about midway between the North and South—advertises the following: “—in conformity with the spirit of the organic law of the university, is open to all, without regard to sex or race, who are qualified by good moral character, proper age, and suitable education.” A very prominent college of Georgia advertises that first course students are required to give satisfactory evidence to the faculty of such educational qualifications as will be deemed necessary for the successful prosecution of their medical studies. Another college in Georgia, this year, changes from six to seven months’ session. An Illinois college claims that attendance on the winter term of thirty-six weeks is compulsory, but that the summer term of twelve weeks is optional. Another Illinois college holds only evening sessions. An Iowa college in 1906 announced that in that year preliminary requirements would be a high-school course or its equivalent. A Kentucky medical school requires applicants to be sufficiently proficient in English, arithmetic, algebra, physics, and such Latin as would be acquired in one year’s study. Louisiana has a college giving four sessions of

twenty-six weeks each. Mississippi has a college in a town of two thousand people. New York city has a college giving four sessions of only seven months each. North Carolina has a college in a town of eight hundred and twenty-four inhabitants. An Oregon school advertises that members of the faculty do not hold examinations for entrance. South Carolina has a school with this interesting statement of requirement: "or evidences of education satisfactory to the faculty." Tennessee has a medical department of a university where we are to understand that recommendations from two well-known physicians are requirements, and the clinical facilities are obtained in a town of six hundred people. Texas has a college giving four sessions of six months each. West Virginia has a college in a town of 1900 people.

A graduating physician is supposed to have a general knowledge of anatomy, materia medica, therapeutics, chemistry, surgery, physiology, bacteriology, biology, gynecology, pathology, toxicology, pharmacology, and a score or more of other

education and culture as 21 to 27 months is to special education and partial culture. To sum up the question of the comparison of medical and dental education, I have but one question to ask the pessimist: Which is the safest practitioner to let loose on the public?

You have met Dr. B. He is the fellow that says dental societies and their results are so different from and inferior to the medical ones.

This is a point that is talked about so much today that I fear that here in New England the men would be most interested in the conditions of medicine and dentistry as related to their respective states alone. Now, while the comparison of conditions here in New England is favorable to dentistry, it is my thought that perhaps we are willing to yield the point that possibly the conditions in other states are not so favorable.

The following table gives the number of physicians and dentists in the New England states and the number in their respective state medical and dental societies, up to October 1906:

	Pract. Med.
Maine	1167
New Hampshire	671
Vermont	680
Massachusetts	5066
Rhode Island	690
Connecticut	1288

State Soc.	Pract. Dent.	State Soc.
486	374	121
403	190	93
416	162	110
3044	1375 to 2000	515
322	325	85
780	550	208

"ologies." He is expected in from twenty-four to forty months to acquire all this, while a graduating dentist has been given from twenty-one to twenty-seven months to secure theoretical and technical training for his special calling. A memory of algebra comes to the rescue of the tired cells of my brain, and the problem is solved: 24 to 40 months is to general

Number of physicians and dentists not members of their medical and dental societies:

	Non-members.	
	Med.	Dent.
Maine	681	253
New Hampshire	268	97
Vermont	264	52
Massachusetts	2022	860 to 1485
Rhode Island	368	240
Connecticut	508	342

The lowest percentage of dentists in state dental societies in New England is 23 per cent. and the highest 68 per cent. For years we have had one of the editors of dental journalism, Dr. J. N. Crouse, claim there was not a state in the United States that had more than 10 per cent. of its dental practitioners in its society. If you will investigate you will find that the various medical societies in New England have a small percentage of their members in attendance at the annual meetings, and that the medical and surgical exhibits create greater interest than does the meeting proper. To obtain essays of worth and men to discuss them is also a problem. If you will examine medical literature for the last decade you will find many articles and editorials treating of educational and society shortcomings. As illustrating a few pointed complaints see the following editorials in the *Journal of the American Medical Association*: January 20, 1906, "Contract Practice"; September 8, 1906, "Quack Doctors and Quackery"; January 12, 1907, "The Trading Stamp System in Medicine."

The *California State Journal of Medicine* for October 1906 has a most cheerful editorial for the depressed dentist entitled "The Sins of Physicians."

The refined dental conscience has been irritated lately by the evils of the proprietary drugs and nostrums. We—Tom, Dick, and Harry—in using some one of these, may feel that we are in strong and representative company, for you will find the deans and professors of many of our dental schools heading the list of testimonials. For some months a supposed M.D. has been traveling over New England selling office and town rights for the use of an "internal drug system for painless dentistry." The testimonials he

showed from teachers of dentistry and members of examining boards would bulge the eyes of the manager of a fake remedy "testimonial-bureau" green with envy. The latest and real up-to-date testimonial is given on the engraved card of one of our best-known deans and oral surgeons. For the gem of testimonial we must, however, turn to one from a member of our Massachusetts Dental Society:

"AN HYPERTROPHIED PULP.

"You want to know, Dr. —, what I think of your preparations. Well, here it is. I can take your —, wet a pledget of cotton with it, dip that into your — (you ought to call it 'Benumber') put this on to an exposed pulp and get anesthesia in half a minute. Then bur out that sleeping pulp without pain. Then I put into the pulp-chamber a —, over this a permanent filling at first original sitting. I never remove the nerves out of the canals. That is unnecessary work.

"The above treatment is the acme of simplicity, and the results are satisfactory. No ulceration or other trouble.

"One year ago I had an hypertrophied pulp that filled the cavity of decay. I put on to the pulp some — for a few moments to benumb it; then cut it off even with the floor of the cavity of decay, and stopped the flow of blood with —; excavated the cavity, dried it out, then put squarely upon the pulp a —, over this a permanent filling. There has been no trouble with that tooth from that day to this—December 1906. Such a unique experience as this is something more than you claim, and is remarkable to the last degree.

"M. M. —, D.D.S., —, Mass."

This testimonial brings to my memory thoughts of the late Dr. J. Foster Flagg, when he lectured on those nice, quiet, sleeping pulps mentioned in this testimonial. One such was a sleeping beauty in September, a sleeping volcano in February, and an erupted volcano in March,

and by May the Doctor of Dental Surgery was, in the mind of that patient, a Doctor of Doubtful Skill.

I am not going to weary you with a dissertation on the trouble medicine is having over the nostrum family, for all you need do is to write to the makers of any of their products a letter of inquiry as to the worth of their drugs, and you will be furnished with testimonials galore.

If you are interested in the opinions of medical men relative to this evil it would be profitable to read the following articles in the 1906-07 issues of the *Journal of the American Medical Association*: "Proprietary Medicines," by A. Jacobi, M.D., New York; "Proprietary Medicines and Their Abuses," by Geo. Dock, M.D., Ann Arbor; "The Physician's Responsibility for the Nostrum Evil," by Richard C. Cabot, M.D., Boston; "Proprietary Medicines—Some General Considerations," by Geo. H. Simmons, M.D., Chicago; "Effect of Proprietary Literature on Medical Men," by N. S. Davis, M.D., Chicago; "The Responsibility of the Medical Teacher for Existing Conditions," by C. S. Williamson, M.D., Chicago; "The Evils of Preparatory Medicines," by Joseph A. Pettit, M.D., Portland, Oregon; "The Elimination of the Nostrum Traffic, an Evident Duty of American Physicians," by M. G. Wilbert, Ph.M., Philadelphia; "Relations of Physicians to the So-called 'Ethical' Proprietary Medicines," by C. B. Kuykendall, M.D., Pomeroy, Washington.

Perhaps the most telling paper yet presented to the medical profession in relation to this great evil was that of the editor—Edward Bok—of the *Ladies' Home Journal*, before a large gathering of physicians in Philadelphia, entitled, "The Physician and the Nostrum."

The *Journal of the American Medical Association* is generally admitted to be the representative journal of the medical profession in the United States. While admitting this, it is well to remember that there are many other journals not of a representative nature, and some are not free from the so-called trade influence. There can be no question whatever that dentistry in the United States needs a journal to represent dentistry on lines similar to that journal which represents medicine. Well, how are we going to do it? From all that has been written and said for and against independent dental journalism, three great fundamental principles can be rescued from the fray: (1) The dental profession must be organized into a national society, representative of the calling; (2) the journal must have a subscription and advertising income large enough to be more than self-supporting—the subscription income must come mainly from your national society; (3) independent journalism cannot be built up by abusing and slandering trade journalism.

For some years the essayist has been connected with a successful publishing house in minor capacities—as a stockholder, contributor, and director. Naturally observations were made of those things or events which made for success. I will mention a few: We never held subscribers very long on pure sentiment; there had to be one head to every department; the head of every department gave his full energy and time to that end and had to be paid accordingly; we found no history of a successful publication which did not depend on its advertising for its main income; the larger the subscription list, the higher were the advertising rates; last, but by no means least, we never overcame competition by abuse

or slander, but only by giving a better publication. If you will take time to investigate the success and standing of the *Journal of the American Medical Association*, you will find it departs in no radical measure from those fundamentals which go to make up success in bringing forth the many other publications which cater to worlds other than medical.

Intelligent members of dentistry are pessimistic when the value of exhibits at our conventions are considered. We have been informed by some of the practitioners that medical societies in general did not countenance or have charge of the space where medical supply houses exhibited their goods. I find from medical men in position to know, that they sell space to the dealers in the same way that we do to the dental trade. Certain it is that the medical and surgical exhibit at the meeting of the American Medical Association last June at the Mechanics Building in Boston was controlled by that society. If you attended that exhibit you certainly must admit that conditions were such as to put to shame the wildest dreams of the dental exhibit objector.

The dental practitioners residing in places of large population and business activities have never known the lack of such a necessity as good dental depots, where all that is essential in appliances and materials is on daily exhibit. What of the practitioner many miles from dental depots, whose only chance to see a good exhibit is when he attends your conventions? When you condemn exhibits are you giving these members a helping hand? An exhibit rightly controlled is one most important part of

a successful convention. I hear again the old claim that exhibits detract from the higher and better part of dentistry—that is, from the addresses and essays. If this last claim be true, then, to be logical, you must admit one of two things—either your addresses and essays or the *esprit de corps* of your membership are at fault. A certain deacon late in life made a rather prolonged and extensive journey to foreign lands. (Report said he was not a deacon in his younger years.) On his return home he was much quizzed as to his opinions of foreign lands and cities. One of the elderly deacons was desirous of his giving them his impressions of Paris. He was asked several times before he consented, for there was an unusual tendency to pass by Paris. At last he said that it had produced the most peculiar impression of all—an impression that he could not chase from his mind—that he should have visited Paris before he joined the church. Can it be that the exhibit is the Paris of the dental convention?

Tight shoes are mighty uncomfortable, but they have a virtue—you forget your other troubles. Pessimists are mighty unreasonable, but they have a lasting virtue—they will cure your blues. There are good members of dentistry, there are bad members of dentistry, yet this one great fact stands out prominently—their badness is not due to dentistry or its teachings. There is the chaff and the grain, the tares and the wheat—together mixed, yet capable of separation. Then I say to you, gentlemen, separate! Error and truth exist side by side, even in medicine and dentistry.

DISCUSSION.

Dr. F. T. MURLLESS, Jr., Windsor Locks. I have found great pleasure in the perusal of the advance sheets of Dr. Flanagan's address, and it has been even a greater pleasure today to hear the words spoken, and to feel the vitalizing influence of his voice and enthusiasm.

Differentiation is the measure of progress and the gage of distinction, be it distance or time, beauty or attainment, to which consideration is given. Life for each individual is made up of distinctions and comparisons, and whether involving odium or honor, irritation or inspiration, is dependent largely upon the pessimism or optimism of the mind whence the comparison comes. Comparison may be the lure of emulation, the goal of competition, or it may be a veritable ball and chain to the feet, hampering effort and paralyzing enterprise.

Dr. Flanagan's attitude is that of hopefulness and faith, and he resents the hampering of either men or dentistry by the conventional morbid criticism and self-belittlement which is so fatal to success. There is a great difference between success and perfection. True success is measured not only by ideals, but has another relation—which lies in how great an advance can be attained over and beyond what might be termed "a practical result." This margin of difference has its value, for this is the stuff from which we re-fashion ideals.

The eye and the mind are ever alert to discern perfection, though it is only by comparison that we even have the impression of it, or, more accurately, it is through comparison that we struggle to acquire a more distinct idea of what

perfection may be. Any approach to perfection, whether displayed in a peach or a rose, physique or mind, arouses interest and appreciation. But quite as much as by these, our admiration and enthusiasm are aroused by the agency or method by which they have been developed, and in corresponding degree as vital interests are involved the instrument rises in importance, and to the degree in which dependability and freedom from accident are characteristic of its operation, the means rivals the products in its command of human interest. By these standards we make comparison between the kindred arts of medicine, surgery, and dentistry. We owe much to medicine. In fact, to most of humanity it is a refuge, a rock of safety, a staying hand, the object of heartfelt gratitude, but as a matter of fact it is not a certain resource. Even some of its most apparent victories are open to cynical comment from unsympathetic observers, and all because, as a matter of fact, it must divide the honors with the old stand-by—*vitality*. Then, again, medicine is largely palliative in its influence; its most positive data are concerned with methods which, for instance, control pain but do not touch causes.

Surgery, too, is a magnificent resource. Its benefits are indeed worthy of the highest praise, and its interferences with disease conditions are blessings; but surgery maims to heal. At best it gives back to usefulness but a marred and diminished specimen of humanity—physical perfection and efficiency, and capacities of resistance, as expressed in terms of vitality, have been impaired.

The dental outlook today is along far different lines. Our work is now in the direction of perfecting the organism. Dentistry is the focal point of modern prophylaxis, minimizing the influence of adverse forces, and directing development so that the initial impulse, as expressed in the embryo, may escape pathological and traumatic dangers, and develop a perfect specimen after its kind with body and individuality, having vitality for the resistance of the attacks of disease, and untrammelled by the need of surgery.

The instrument dentistry—God bless it!—is coming into its own. Its greatness is established, its honors await it, and, for what it *now* is, it has become the leader of the healing arts.

Dr. JAMES McMANUS, Hartford. In looking back over a few years and recalling the papers and discussions that I have heard, I could not help but feel to-day a pleasure, which I hardly anticipated, in hearing such a paper as Dr. Flanagan has read, and such a discussion of it as Dr. Murlless has presented, and somehow the whole volume of dentistry seems to rise about one hundred and fifty feet higher than the position it occupied in the years past. I have had the opportunity in the past—and I think Dr. Flanagan rather intended to give me a knock when he spoke of that—to talk to a good many men of dentistry, surgery, and medicine, but I do think, in all candor, that if any man looks over the literature of medicine and dentistry and compares what medicine is doing and has done with what dentistry is doing and has done, he will have to acknowledge that dentistry has far surpassed the older profession; that dentistry—in the character of the men in the profession, of the schools for teaching dentistry, and the students

turned out from these schools—is on a par with any of the other professions of the country. There is one thing which I think many dentists do not realize, namely, that from no institutions in the country are students graduated from whom so much is expected as of the graduate in dentistry. When a man graduates in medicine he is supposed to be just in the position to commence to learn, and he does just commence to learn because he goes out and practices on the public, and it is only by practice and experience that he reaches the point where he knows much of anything. Take the graduates in medicine of any college; you will find that but a small proportion of them get hospital appointments, and these men go there and remain for a period of two years, and have the best opportunities afforded anywhere to see the methods of practice of the best men in the country. The majority of graduates go out into practice, and have to learn through their mistakes and experience; but the dental student when graduated is expected to know it all. He must know enough to pass the examination and to perform operations, and, in addition, he must go before a board and perform operations under difficult surroundings and circumstances, and his operations must pass the test of the examiners before he is allowed to practice in any state in the country. I think we have reason to be intensely proud of the standing of our dental colleges and of our dental students, who I think are often far in advance of the graduates of other professions.

Dr. H. EVERTON HOSLEY, Springfield, Mass. I think Dr. Flanagan's paper offers a very good lesson for the dental profession to learn. Being pessimistic does not do you any good, or do the pro-

fession any good, neither does it improve the opinion that other people form of you. If the dental profession would form itself into an optimist club, and inform the medical profession what good fellows we are, what we can do, and show them what we know, they would have a better opinion of us.

Dr. Flanagan has taught us a good lesson, and along this line I would like to speak in regard to what we say sometimes of another man's work. Let us say nothing but good, remember that the other man is a fellow practitioner, and that we all do some things of which we are not justly proud. Let us keep these things to ourselves, because the public judges us from what the profession says of its members. I think we should take a more optimistic view along the line of educating the public, and the profession is responsible for this education. I believe every dentist should take that lesson home with him.

Dr. JAMES E. POWER, Providence, R. I. The comparison of the medical and dental professions at this time teaches us that there is little accomplished by such a comparison. Each profession has duties to perform which belong to it alone, and upon which the other cannot enter.

In order that my position in this matter may be clearly understood, I shall preface my remarks by stating that I am proud to be even an ordinary member of the dental profession. I prefer dentistry to any other profession; by this I mean modern dentistry—that dentistry which embraces more than a knowledge of mechanics. I believe that as such it has unlimited opportunities for expansion. We are proud of the foundations upon which it was built, and from these foundations the rich successes which have

been reaped have placed dentistry in a better position among the professions of the world. On the other hand, I believe that the dental profession, in many instances, has placed itself in a most critical position, and that it alone is responsible for that condition. We as a profession move the standard of our profession up or down, just as thermal changes move the mercury in the thermometer. We retard or facilitate the progress of dentistry just as the elements control the mercury. The public, medical profession, and the other professions will accept the estimate upon dentistry that dentistry places upon itself. We are the ones who estimate our worth, and the world accepts us at our own estimate. One of the most detrimental factors is that tendency or inclination, on the part of many of our profession, to give unwise counsel to young men who seek their advice concerning the best course for them to pursue in order to become proficient in the science of dentistry. Many take these students (so-called) into their offices. They in turn, by a superficial study, get a sufficient poll-parrot or phonographic knowledge to enable them to pass the state examining boards, and in the eyes of the law they are dentists. The medical profession and the public will look down upon such a process of education, and naturally conclude that dentistry cannot amount to much, if a person can acquire a sufficient knowledge in a dental office to pass the examinations as prescribed by law, and acquire this knowledge in from six months' to two years' time. Physicians justly conclude that dentistry must consist chiefly of practical mechanical work. And naturally, when these men are compared with the men of the medical profession, the comparison is unfavorable to our profes-

sion. Where in this country can a man go into a physician's office and remain two years, and then engage in the practice of medicine? Still we affirm that the dental is the equal of the medical profession. I believe and hope that it is. On the other hand, I am forced to admit that the condition just described does not produce positive proof in the support of this belief, but does irreparable injury to us, individually and collectively, and so I say again, that in this way, if in no other, we prevent the onward march of dentistry.

A possible remedy for this is first to teach the public, and then the medical profession, that dentistry cannot be learned properly in a dental office. I cannot recall even one office in this country which affords the opportunity for a man to learn dentistry correctly. He may learn to make artificial dentures, and to fill teeth, but, gentlemen, that is not dentistry. He can, with the assistance of a quiz-master, become proficient in theory to the extent of passing the examinations of the state boards, but the passing of the state board examinations does not make a dentist. To my mind the passing of an examination means nothing unless the candidate has acquired the knowledge by proper methods and through proper channels. Take for instance the Thaw case which has been tried recently in New York. This, like many other legal cases, may demonstrate how much an examination may or may not signify. There is no question in my mind that Mr. Jerome, under the guidance of a quiz-master and with a little study, could pass an examination before any state board of medicine in the country. But even after the law said, "Go ahead and practice medicine," a mere child would know that he would be an

unsafe person to engage in the treatment of disease. Therefore, gentlemen, I say they who have learned dentistry under the conditions existing in an office, as before described, are not competent to treat the diseases which belong to the science of dentistry. I am speaking now particularly of the conditions of today. I realize that there are men who have never attended a college, that can and do practice dentistry successfully, and to these fathers of dentistry, who have accomplished so much with so little, I bow in reverence. But today dentistry offers greater and better opportunities for man to learn its secrets. These men have done much to draw aside the curtains of darkness and thus allow the light of knowledge to shine in. If they had been afforded the advantages of a dental education such as is within the reach of students today, I dare say that their accomplishments would be much greater than ours.

I believe that the progress of this profession is hampered also by the laxity of the ethical education of its students. In every school there should be given a course in ethics, if only consisting of one or two lectures. These lectures should be given to the graduating class, teaching them the value of ethics; teaching them that the commercial and professional codes are synonymous. By this method, first bring to their minds the truth that dentistry is one of the learned professions; that the mission of dentistry is not beyond commercial ends and aims. We must receive money for our services, or we cannot pay our bills, and if we cannot, we burden society. Our ambitions, however, should not be based upon a commercial basis. There are men who are so anxious to practice dentistry for the sole benefit of humanity that they

consider it unprofessional to even ask money for their services. The result is that they cannot respect the laws of society. Then there are other men whose commercial instincts are so highly developed that for them the accumulation of money is the one object in life. They do not attend dental meetings, such as this one, which may benefit them. Nor do they mingle with their fellow practitioners and thereby learn to know them. They do nothing but practice for the money that they may get in return for their services. These men never reach the higher or finer side of dentistry. There is another class of men—the fakirs—who by their alluring signs attract the poor man, who is anxious to pay his bills, but cannot afford to pay the fees demanded by some dentists; consequently, he falls into the hands of these charlatans, and we say that it is the poor man's fault. Not so much his fault, as it is his narrow estimation of dentistry from a certain low standard. Dentists should teach the public the value of dentistry. It is our duty to appear before the legislature and legislate against these unscrupulous men; not because they are advertising men, but rather because they are employing unskilled men, who are paralyzing all efforts in the scientific world, and who are increasing the misery of mankind to such an extent as to compel humanity to demand that something be done. If we do our duty in this respect, advertising offices, unskilled men, and the fakir will be things of the past. If, however, we must compare dentistry with medicine, compare it with the medicine of the ancients during the time of Æsculapius, Hippocrates, and Galen, and set our standards on the same high foundations which characterized their ideals, and which made the medicine of

the Greeks the medicine of the world. Let us work toward the high ideals that these men believed in, and which were part of their creed. We shall then reach the standard which Dr. Flanagan outlines, and take an incontestable position among the other professions of the world. It is the work which dentists do in the way of scientific work, such as was presented by Dr. Noyes last evening, that will help to raise the standard of dentistry. But, you say, we are not all qualified to carry on this grade of work. True, but it is equally reasonable to suppose that all of us are qualified to do things which Dr. Noyes cannot do; possibly not as valuable from the scientific standpoint, but equally valuable in helping to raise the standard of our profession.

It is these efforts which raise us above what Wendell Phillips termed hewers of wood and carriers of water. And, gentlemen, the embodiment of all this—of everything that is good, of everything which inspires us to work for the good of our fellow men and of our profession—is manifested in the one word “culture.”

In concluding, with your permission, I shall use the words of Matthew Arnold, the apostle, to outline what our duty consists of, viz, “To render the intelligent being yet more intelligent; to make reason and the will of God prevail.”

Dr. F. B. NOYES, Chicago, Ill. I was very much interested in the paper, and I think as Dr. Flanagan has said, we need more of optimism and less of pessimism; more men who are trying to boost the profession up, and fewer who are trying to pull it down. We need to encourage ourselves, and the best way to do this is to look squarely at our weaknesses, and not shut our eyes to them. I think every medical educator will admit very

promptly, if he is familiar with the conditions, that the dental graduate is better fitted to practice his profession than is the medical graduate his. I am associated as a member of the faculty of a dental school with men in the medical school, and they say that the man who graduates from the dental department of the university with which I am connected is better fitted to practice dentistry than the man who graduates in medicine is fitted to practice medicine.

Now, to look at the other side of the question. It is a fact that while our students in the dental department are given the same course practically in histology that is given the men in the medical department, I would be afraid and ashamed to have my men go up for examination in histology before the medical faculty. They would not pass it. I appeal to you, then, and every chance I get I shall appeal to the profession, to help us change that condition. The fundamental principle of the professional school must always be that the faculty—the professor—presents the field to his students; he points out the subject to them; it is there for them to take, and I say to my students, “I cannot, like the high-school professor, stand over you with a club and bang it into your heads.” If I could give all of my time to teaching in a school, I could perhaps give weekly written quizzes, and grade these papers, and go over with care these four hundred examination papers a week and make these men imbibe as much histology as do the medical men. But I have to earn a living, and can only present the subject, and if they will not take it, I cannot compel them to.

Now, the same condition as that just described does not obtain in the medical school. When you present this subject

to the men, they are eager for it—they want it; they know they must have it. What I want in the dental school is to have men as eager for what is presented to them as is the medical student—as eager to get an idea of the structures of the body in terms of its cells; to get an intelligent basis for the treatment of the disease conditions they must handle, and to acquire the knowledge which will give them the ability to understand the results of research work so that it will actually mean something to them, in order that we may not hear—as so often we do hear at society meetings—“I could not listen to that long, dry paper, but if you will give me the formulas you use, I would be glad to have them.” Now, the profession can change that—we who are trying to present these subjects—and I make it a strong personal appeal to do so; for I work myself out trying to teach this. I put all the “ginger” I can scrape up and throw all the energy I can get into my talks to the classes in order to tell them what they need, and when I come to read the examinations I wish I were dead and buried! I say to myself, What is the matter? Am I a fool? Can I not impress this necessity upon anyone? Where we most need help is in convincing the dental students that they need that kind of knowledge in addition to knowing how to make a filling and how to make a crown.

I gave an examination a few weeks ago to a class of sixty, and out of that sixty thirty failed, and I went before the class and talked to them for thirty minutes. I said, “Boys, I cannot make you learn this subject, but if I could only get you to know that now is your chance and induce you to take your chance while you have it. You are going out into practice, and I would say nothing that would be-

little the necessity for mechanical skill, for if you cannot make a perfect filling, if you cannot treat caries, you cannot practice dentistry successfully; you will have to exercise your skill from six to eight hours every day, but after you leave here you won't have the opportunity to work three hours a day in a histological laboratory. Now you have the chance to learn the histology of the structures of the teeth; then your chance will be gone." And if the men of the profession in the country will send boys to us with that idea—that it is just as important to know something of and to be familiar with the mouth-structure, or of what must be the real basis for treatment of diseases of the soft tissues anywhere, as it is to know how to fill or crown a tooth—when they come to us we shall not be afraid to make comparison of the knowledge of the dental men with that of medical men on any so-called theoretical subject.

DR. FLANAGAN (closing the discussion). Some years ago, perhaps twenty, I journeyed to Philadelphia for an education in dentistry, after having studied for three years and four months in an office, and the reason why I did this was because it was then the consensus of opinion that the real dental center of education was Philadelphia. For the last five years I have made this claim, and if any of you gentlemen did not agree with me, I think you have now changed your mind, because we have had here an exemplification—a substantial something that leads us to believe the center is somewhat near Chicago at the present time.

Dr. Noyes has said that he becomes so discouraged that he would feel better, perhaps, if he were buried. Dr. Noyes, I want to tell you that there are other men, who are not so closely associated

with the teaching forces of the colleges, that become just as discouraged on this question. The speaker is one of them; Dr. McManus is another, and there are many others who are equally discouraged. Dr. Noyes has spoken regarding the conditions in dentistry today. I want to thank him. The time is at hand when a man who stands prominent in the profession while yet the only thing you can say for him is that he has a fine practice, that he has a grand income—because he does nothing in return for his profession—instead of being a marked man for praise will be a marked man for condemnation. And why, gentlemen? Have you ever read the history of the plutocrats—the Carnegies, the Rockefellers, and others of that class? When they arrive at a certain time of life, what are they doing? They suddenly discover that they are on the wrong road to happiness, and these gifts of libraries, museums, etc., are an expression of what? Of the unhappiness in their minds; of an effort to rid themselves of the very thing that they thought was the indispensable thing to work for. Now I may be wrong in this, but that is my impression, and it seems to me that the dental societies, especially, should give recognition to the men who are absolutely away from the financial end of it. Of course we all have to live; are obliged to, or should, pay our bills; yet this commercialism is in dentistry and to the detriment of dentistry. Do you suppose for one moment that if Dr. Noyes had gone into the commercial world, and had put the same amount of energy and vitality into a life of business, do you suppose for a moment that he would be a numskull there? Don't you think he would have those thousands of dollars that so many are striving for? Instead of that, he is get-

ting an existence as a dental teacher giving his all to the profession. How many of the dental students of the profession appreciate that which they receive from the men who sacrifice almost everything in order to give of their best efforts to them?

The President then called on Dr. E. Prentis, New London, for the report of the Legislative Committee.

The report of Dr. Prentis consisted in the reading of the proposed dental law, at that time being considered by the legislature. He stated that the committee was endeavoring to have the law passed at the present session if possible.

Dr. G. M. GRISWOLD, Hartford, then offered the following resolution with regard to the proposed dental law:

RESOLVED, That should any statute be enacted imposing any duties upon this society, that the officers and executive committee are authorized and empowered to take such action as may be necessary to carry into effect such statute.

Dr. ADAMS moved as an amendment to Dr. Griswold's motion the addition of the words "before the next regular meeting of the society."

Dr. Griswold accepted the amendment, and the resolution was adopted.

ELECTION OF OFFICERS.

The next order of business was the report of the Nominating Committee. Dr. McLEAN, chairman, presented the following list of nominations for officers for the ensuing year:

President—F. Hindsley, Bridgeport.

Vice-president—W. O. Beecher, Waterbury.

Secretary—E. S. Rosenbluth, Bridgeport.

Treasurer—F. W. Brown, New Haven.

Assistant Secretary—A. E. Carey, Hartford.

Librarian—R. H. Keeler, New London.

Editor—A. H. Spicer, Westerly, R. I.

Executive Committee—F. T. Murlless, Jr. (chairman), Windsor Locks; F. J. Erbe, Waterbury; W. V. Lyon, Bridgeport.

The association proceeded to ballot, and the result was the election of the list of officers above named.

Dr. MURLLESS moved that the newspapers of New London be given a vote of thanks for the satisfactory manner in which the meetings had been reported.

The motion was carried.

The secretary, Dr. ROSENBLUTH, then read the following list of applications for membership in the society:

Arthur Milton Sweet, Essex, Conn.

Samuel W. Ritch, New Haven, Conn.

Albert N. Gaylord, New Haven, Conn.

George H. Nettleton, New Haven, Conn.

W. J. Hogan, Hartford, Conn.

Herman Levin, Hartford, Conn.

L. C. Bell, Waterbury, Conn.

Frank E. Judson, Bethel, Conn.

John H. Eldred, Norwich, Conn.

Thomas Tunney, New Canaan, Conn.

John M. O'Connell, Westerly, R. I.

C. Clayton Ward, Hartford, Conn.

Dr. ADAMS moved that the Secretary be authorized to cast one ballot for the list of applicants as read, for election to membership in the society.

The motion was carried.

The Secretary thereupon cast one ballot for the list of applicants for membership, and the list was declared elected.

The Secretary then read a communication and resolutions from the American Society of Orthodontists, as follows:

ST. LOUIS, Mo., January 24, 1907.

THE CONNECTICUT STATE DENTAL ASSOCIATION:

Gentlemen,—The inclosed resolutions have been sent to the state dental societies and

some of the local societies, with the request that they be adopted by those societies.

I have the honor to request on behalf of the American Society of Orthodontists that your society take action, and that your secretary notify me of the same.

Very respectfully,

FREDERICK S. MCKAY,
Secretary.

[*Inclosure.*]

RESOLVED, That in the opinion of the members of this society, the practice of paying or receiving any commission, honorarium, or any sort of fee, in consideration for the reference of a patient, is both unwarrantable and unprofessional; and be it

RESOLVED, That the payment or reception of any such commission, honorarium, or fee, to or by any member of this society, shall be sufficient cause for the expulsion of said member, by vote of the society after proper hearing and conviction; and further be it

RESOLVED, That in case of co-operation in the care of a patient between a general practitioner and a specialist, there shall be no division of fees, but each man shall render a bill for his personal services.

Dr. ADAMS moved that the communication be received and reported to the Board of Censors for recommendation.

The Secretary then read a telegram from Dr. C. S. Hardy, Summit, N. J., expressing his regret at not being able to attend the meeting.

The President then appointed Dr. Edward Prentiss and Dr. D. W. Johnston as a committee to conduct the new president to the chair.

Dr. CROSBY in presenting the new president said: It gives me great pleasure,

Dr. Hindsley, to surrender to you the gavel of this society, as I know that you will always have uppermost in your mind the best interests of our society.

Dr. HINDSLEY. I thank you, Mr. President and gentlemen, for the honor you have conferred upon me in electing me president for the coming year, and for the confidence you have reposed in me. I am greatly pleased with the officers you have elected to serve with me, and we will endeavor to guard the interests of the society and give you a successful meeting next year.

Dr. JAMES McMANUS moved that the thanks of the society be extended to the retiring officers.

The motion was carried.

Dr. CROSBY. I wish to move that we thank Dr. Anthony for coming here and reporting our proceedings. We appreciate very much his coming, and I move that he be heartily thanked by this association for his services.

The motion was carried.

Dr. HINDSLEY. I would ask the present Legislative Committee to continue to act until the close of the present session of the legislature, or until their successors are appointed. I would also appoint Dr. Crosby as a special committee to look after that part of the dental law referring to the inspection or examination of children's teeth in the public schools.

Motion was then made and carried to adjourn until the next annual session.

THE CLINICS.

Dr. J. E. HEYKE, New Haven, Conn.
“Purifying Scrap Gold.”

Dissolve scrap or sweepings in aqua regia by the aid of heat. Evaporate the acid on a water-bath (in a fume-chamber) and dissolve the residue in distilled water. Filter, and boil the filtrate with oxalic acid, when the gold will be precipitated as pure gold. Collect the precipitate on a filter, wash with water, and dry. Fuse the filter with its contents on charcoal—or in an earthenware crucible—with borax until the gold separates as a globule. After this is allowed to cool, warm the globule in a small quantity of sulfuric acid to dissolve off the borax.

Dr. J. W. BEACH, Buffalo, N. Y.
“Saliva Analysis to Determine the Presence of Potassium Sulfoeyanate.”

Dr. Beach demonstrated the method of testing the saliva for the presence of potassium sulfoeyanate which was introduced by Dr. F. W. Low. He showed a specimen of saliva before treatment which took 216 hours to dissolve one-half grain of gelatin. The saliva of this patient after treatment dissolved the same amount of gelatin in 77 hours, the patient having taken one grain of potassium sulfoeyanate daily for ten days. Test tubes were also shown to indicate the difference in staining power between

the iron subsulfate—or Munsell’s—solution, and the iron perchlorid solution, the latter showing a clear and more perfect staining. Tubes were also exhibited to show how different preparations of iron affect the human saliva when administered internally. In cases where the tincture of iron chlorid, which is the preparation ordinarily given by physicians, is given by the stomach, the potassium sulfoeyanate is decreased. But when the organic irons are given, as in such preparations as Ovoferin, no change is noted. This would indicate that it is well to ascertain what preparation of iron, if any, the patient is taking, and to prescribe accordingly.

Tests were made at the clinic, in numerous instances, of saliva which showed an absence of this ingredient, and in several cases one grain of potassium sulfoeyanate was given, a test made one-half hour later showing a reaction indicated by No. 2 on the color blank, and a third test one-half hour later a proportionate increase. This demonstrates the rapidity of its diffusion. The test was made by taking 2 ccm. of saliva and 2 ccm. of distilled water, thoroughly shaking them together, adding five drops of iron perchlorid, and again shaking the mixture; the resulting shade, when compared with those on the color blanks, indicated the presence or absence of this agent.

Dr. GEORGE T. BAKER, Boston, Mass.
"Orthodontia."

An orthodontia appliance was shown for expanding the arch and aligning the incisor teeth. It was constructed with the Jackson spring clasps of wire smaller than that usually employed, the gage for the clasps being No. 23. The necessary strength and elasticity were obtained by using platinized gold wire instead of German silver. The advantage of such a small wire is that the occlusion is not interfered with, even when applied to the deciduous teeth. The appliance, while removable by the operator, is not by the patient; that is, the patient is not aware that it is removable and consequently does not attempt it. It is removed by the operator at each visit, when the patient is instructed to thoroughly cleanse his teeth by means of the toothbrush and powder as usual. The appliance itself is also sterilized by boiling. In certain cases such an appliance has advantages over one attached to the teeth with wire or silk ligatures. The making of the appliance, also the wires and the plate, No. 36 gage, from which it was constructed were shown.

Dr. GEORGE B. PALMER, New York, N. Y. "Technique of Taking Plaster Impressions for Orthodontia."

In taking an impression care should be exercised to select a sufficiently large tray, one that will allow at least one-eighth inch of plaster over the buccal surfaces of the molars. Those known as the Angle trays are best suited, as they are much higher than the ordinary tray, and can be bent to conform to the case in hand.

The teeth should be thoroughly cleansed and the membrane freed from

mucus by wiping them with cotton. French's impression plaster is dusted into water heated to 93° F. and allowed to settle, when the surplus water should be poured off to get rid of all hard particles. Do not stir or use anything to hasten the setting.

For the upper impression, the plaster should be placed in the tray, flush with the rim, leaving the vault of the tray free from plaster, while the greatest amount is in the anterior portion, extending over the edge on to the handle. Place the tray in the mouth, have the patient close the teeth sufficiently to steady the tray, and bring the plaster in contact with the occlusal surface of the teeth. Raise the lip and by means of the index finger carry the plaster that extends over the rim on the handle of the tray high up and backward over the buccal surfaces of the molars.

The tray is now forced up evenly until all points touch. The teeth will displace enough plaster to flow over the vault, and thus give a perfect impression of that part. The whole mass is steadily supported with the index finger until it becomes thoroughly set; the harder it gets the more perfect will be the result. The tray is now taken away, leaving the impression in the mouth. All small loose pieces should be taken out with liberal pieces of cotton held in the foil-carrier. Grooves are then cut parallel with the canines, but not quite through. Prize and dislodge the front portion with the point of a knife, and then with the thumb and finger dislodge the lateral portions. This leaves the large piece covering the roof of the mouth, which may now be easily removed. All pieces as they are removed from the mouth should be carefully placed on a clean piece of blotting paper—a great many

pieces do no harm, provided all are saved. After it is thoroughly dry, the smaller pieces are put together with celluloid cement or liquid collodion, the larger with wax, and if this be skilfully done, the line of union is hardly noticeable.

In a like manner the lower impression is taken, being careful to observe the essential points above mentioned, especially that of carrying the plaster—which has been built up and outside of the rim on the handle of the tray—well down between the cheek and teeth before forcing the tray home. When the plaster has sufficiently hardened, remove the tray and wipe out all small pieces of plaster with absorbent cotton. Coat with vaselin a piece of gauze about one inch square and place it on the impression lingual to the incisors, and introduce new plaster to form an index of this surface. When hard, remove this index, and use it as a key when assembling the impression.

Dr. N. A. STANLEY, New Bedford, Mass. "The Use of the Matrix."

In demonstrating the use of this very simple matrix which I have used for many years, let me say there is nothing very new or original about it. In coronal approximal fillings, where the adjacent teeth are in position, it is invaluable in my hands. A piece of matrix metal, say German silver No. 36 or 40 gage, is cut sufficiently long that when it is placed between the bicusps, for in-

stance, the ends can be pressed and burnished to the labial and lingual surfaces of the teeth, to form what might be termed a half-ring. Two small holes made with a plate punch in opposite corners enable you to use the matrix around the neck of the teeth, which aids the operator in the adjustment by holding it in place. Insert a little wedge opposite the cervical margin of the cavity. This holds the thin sheet of metal in close contact with the tooth to be filled, and will admit little or no surplus in finishing off. Burnish the matrix against the adjacent tooth from the cavity side. Warm a "gob" of gutta-percha base-plate and stick it on to the buccal surfaces of the teeth, molding it into position with the thumb and finger. Do the same on the lingual surfaces of the teeth. This holds the matrix in contact with the tooth, thus giving a cavity with four walls, against which the filling is built. Of course this is all done after the dam is in place. If the sides of the teeth are coated with a solution of resin or sandarac, the base-plate will stick all the better.

With the cavity prepared and the matrix adjusted, I consider the operation half done. I now fill the cavity from one-half to two-thirds with soft gold foil, and finish it with cohesive gold. The malletting and wedging of the foil will afford all the separation required, and will leave a nice contour which will knuckle against the adjoining tooth.



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